



Studer Micro Series

SW Version 1.2

Disclaimer

The information in this document has been carefully checked and is believed to be accurate at the time of publication. However, no responsibility is taken by us for inaccuracies, errors, or omissions, nor is any liability assumed for any loss or damage resulting either directly or indirectly from use of the information contained within it.

Prepared and edited by
Studer Professional Audio GmbH
Technical Documentation
Riedthofstrasse 214
CH-8105 Regensdorf - Switzerland
<http://www.studer.ch>

Copyright by Studer Professional Audio GmbH

Order no. XXXXXXXX

Subject to change

For Your Own Safety and to Avoid Invalidation of the Warranty Please Read This Section Carefully

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with a dry cloth
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of a polarised or grounding type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus
- Only use attachments/accessories specified by the manufacturer
- Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power supply cord or plug is damaged, liquid has been spilled or objects fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped

Note: It is recommended that all maintenance and service on the product should be carried out by Studer or its authorised agents. Studer cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose the apparatus to dripping or splashing and do not place objects filled with liquids, such as vases, on the apparatus

- No naked flame sources, such as lighted candles, should be placed on the apparatus
- Ventilation should not be impeded by covering the ventilation openings with items such as newspapers, table cloths, curtains etc

WARNING: Do not use this apparatus in very dusty atmospheres, or in atmospheres containing flammable gases or chemicals

- **THIS APPARATUS MUST BE EARTHED.** Under no circumstances should the safety earth be disconnected from the mains lead
- The mains supply disconnect device is the mains plug. It must remain accessible so as to be readily operable when the apparatus is in use
- If any part of the mains cord set is damaged, the complete cord set should be replaced. The following information is for reference only. The wires in the mains lead are coloured in accordance with the following code:

- **Protective Earth (Ground): Green/Yellow (US: Green or Green/Yellow)**
- **Neutral: Blue (US: White)**
- **Live (Hot): Brown (US: Black)**

As the colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- **The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol**
- **The wire which is coloured Blue must be connected to the terminal in the plug which is marked with the letter N**
- **The wire which is coloured Brown must be connected to the terminal in the plug which is marked with the letter L**

Ensure that these colour codes are followed carefully in the event of the plug being changed

- **This unit is capable of operating over a range of mains voltages, as marked on the rear panel**

Lithium Battery



Installed lithium batteries must be replaced by the same or an equivalent type. Danger of explosion if batteries are incorrectly replaced or when terminals are shorted.

Installed lithium batteries must not be exposed to excessive heat such as direct sunshine, fire or the like.

Working Safely With Sound

Although your new console will not make any noise until you feed it signals, it has the capability to produce sounds that, when monitored through a monitor system or headphones, can damage hearing over time. The table below is taken from the Occupational Safety & Health Administration directive on occupational noise exposure (1926.52):

Permissible Noise Exposure:



Duration per day [h]	Sound level [dBA, slow response]
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
<0.25	115

Conforming to this directive will minimise the risk of hearing damage caused by long listening periods. A simple rule to follow is: The longer you listen, the lower the average volume should be. Please take care when working with your audio system – if you are manipulating controls which you don't understand (which we all do when we are learning), make sure your monitoring level is turned down. *Remember that your ears are the most important tool of your trade. Look after them, and they will look after you. Most importantly: Don't be afraid to experiment to find out how each parameter affects the sound; this will extend your creativity and help you to get the best results.*

A1 Safety Symbol Guide



For your own safety and to avoid invalidation of the warranty, all text marked with these symbols should be read carefully.

To reduce the risk of electric shock, do not remove covers. No user-serviceable parts inside. Refer servicing to qualified service personnel (i.e., persons having appropriate technical training and experience necessary to be aware of hazards to which they are exposed in performing a repair action, and of measures to minimize the danger of themselves).

The lightning flash with arrowhead symbol is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Headphones safety warnings contain important information and useful tips on headphone outputs and monitoring levels.

Assemblies or sub-assemblies of this product can contain opto-electronic devices. As long as these devices comply with Class I of laser or LED products according to EN 60825-1:1994, they will not be expressly marked on the product. If a special design should be covered by a higher class of this standard, the device concerned will be marked directly on the assembly or sub-assembly in accordance with the above standard.

A2 First Aid

In Case of Electric Shock:

Separate the person as quickly as possible from the electric power source:

- By switching the equipment off,
- By unplugging or disconnecting the mains cable, or
- By pushing the person away from the power source, using dry insulating material (such as wood or plastic)
- After having suffered an electric shock, always consult a doctor

Warning!



Do not touch the person or his clothing before the power is turned off, otherwise you stand the risk of suffering an electric shock as well!

If the Person is Unconscious:

- Lay the person down
- Turn him to one side
- Check the pulse
- Reanimate the person if respiration is poor
- Call for a doctor immediately.

B General Installation Instructions

Please consider besides these general instructions also any product-specific instructions in the “Installation” chapter of this manual.

B1 Unpacking

Check the equipment for any transport damage. If the unit is mechanically damaged, if liquids have been spilled or if objects have fallen into the unit, it must not be connected to the AC power outlet, or it must be immediately disconnected by unplugging the power cable. Repair must only be performed by trained personnel in accordance with the applicable regulations.

B2 Installation Site

Install the unit in a place where the following conditions are met:

- The temperature and the relative humidity of the environment must be within the specified limits during operation of the unit. Relevant values are the ones at the air inlets of the unit (refer to Appendix 1)
- Condensation must be avoided. If the unit is installed in a location with large variation of ambient temperature (e.g. in an OB-van), appropriate precautions must be taken before and after operation (refer to Appendix 1)
- Unobstructed air flow is essential for proper operation. Air vents of the unit are a functional part of the design and must not be blocked in any way during operation (e.g. by objects placed upon them, placement of the unit on a soft surface, or installation of the unit within a rack or piece of furniture)
- The unit must not be heated up by external sources of heat radiation (sunlight, spotlights)

B3 Earthing and Power Supply

Earthing of units with mains supply (class I equipment) is performed via the protective earth (PE) conductor integrated in the mains cable. Units with battery operation (< 60 V, class III equipment) must be earthed separately. Earthing the unit is one of the measures for protection against electrical shock hazard (dangerous body currents). Hazardous voltage may not only be caused by a defective power supply insulation, but may also be introduced by the connected audio or control cables.

If the unit is installed with one or several external connections, its earthing must be provided during operation as well as while the unit is not operated. If the earthing connection can be interrupted, for example, by unplugging the mains plug of an external power supply unit, an additional, permanent earthing connection must be installed using the provided earth terminal.

Avoid ground loops (hum loops) by keeping the loop surface as small as possible (by consequently guiding the earth conductors in a narrow, parallel way), and reduce the noise current flowing through the loop by inserting an additional impedance (common-mode choke).

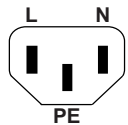
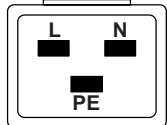
Class I Equipment (Mains Operation)

Should the equipment be delivered without a matching mains cable, the latter has to be prepared by a trained person using the attached female plug (IEC 320 / C13 or IEC 320 / C19) with respect to the applicable regulations in your country.

Before connecting the equipment to the AC power outlet, check that the local line voltage matches the equipment rating (voltage, frequency) within the admissible tolerance. The equipment fuses must be rated in accordance with the specifications on the equipment.

Equipment supplied with a 3-pole appliance inlet (protection conforming to class I equipment) must be connected to a 3-pole AC power outlet in such a way that the equipment cabinet is connected to the protective earth.

For information on mains cable strain relief, please refer to Appendix 2.

Female Plugs (IEC320), Front-Side View:		
 <p>IEC 320 / C13</p>	 <p>IEC 320 / C19</p>	
European Standard (CENELEC)		North American Standard (NAS)
Brown	L (Live)	Black
Blue	N (Neutral)	White
Green/Yellow	PE (Protective Earth)	Green (or Green/Yellow)

Class III Equipment (Battery Operation up to 60 VDC)

Equipment of this protection class must be earthed using the provided earth terminal if one or more external signals are connected to the unit (see explanation at the beginning of this paragraph).

B4 Electromagnetic Compatibility (EMC)

The unit conforms to the protection requirements relevant to electromagnetic phenomena that are listed in guidelines 2014/53/EU and FCC, part 15.

- The electromagnetic interference generated by the unit is limited in such a way that other equipment and systems can be operated normally
- The unit is adequately protected against electromagnetic interference so that it can operate properly

The unit has been tested and conforms to the EMC standards of the specified electromagnetic environment, as listed in the following declaration. The limits of these standards ensure protection of the environment and corresponding noise immunity of the equipment with appropriate probability. However, a professional installation and integration within the system are imperative prerequisites for operation without EMC problems.

For this purpose, the following measures must be followed:

- Install the equipment in accordance with the operating instructions. Use the supplied accessories
- In the system and in the vicinity where the equipment is installed, use only components (systems, equipment) that also fulfill the EMC standards for the given environment

- Use a system grounding concept that satisfies the safety requirements (class I equipment must be connected with a protective ground conductor) and that also takes into consideration the EMC requirements. When deciding between radial, surface, or combined grounding, the advantages and disadvantages should be carefully evaluated in each case
- Use shielded cables where shielding is specified. The connection of the shield to the corresponding connector terminal or housing should have a large surface and be corrosion-proof. Please note that a cable shield connected only single-ended can act as a transmitting or receiving antenna within the corresponding frequency range
- Avoid ground loops or reduce their adverse effects by keeping the loop surface as small as possible, and reduce the noise current flowing through the loop by inserting an additional impedance (e.g. common-mode choke).
- Reduce electrostatic discharge (ESD) of persons by installing an appropriate floor covering (e.g. a carpet with permanent electrostatic filaments) and by keeping the relative humidity above 30%. Further measures (e.g. conducting floor) are usually unnecessary and only effective if used together with corresponding personal equipment
- When using equipment with touch-sensitive operator controls, please take care that the surrounding building structure allows for sufficient capacitive coupling of the operator. This coupling can be improved by an additional, conducting surface in the operator's area, connected to the equipment housing (e.g. metal foil underneath the floor covering, carpet with conductive backing)

C Maintenance

All air vents and openings for operating elements (faders, rotary knobs) must be checked on a regular basis, and cleaned in case of dust accumulation. For cleaning, a soft paint-brush or a vacuum cleaner is recommended. Cleaning the surfaces of the unit is performed with a soft, dry cloth or a soft brush.

Persistent contamination can be treated with a cloth that is slightly humidified with a mild cleaning solution, such as dishwashing detergent.

For cleaning display windows, commercially available computer/TV screen cleaners are suited. Use only a slightly damp (never wet) cloth.

Never use any solvents for cleaning the exterior of the unit! Liquids must never be sprayed or poured on directly!

For equipment-specific maintenance information please refer to the corresponding chapter in the operating and service manuals.

D Electrostatic Discharge during Maintenance and Repair

Caution:



Observe the precautions for handling devices sensitive to electrostatic discharge!

Many semiconductor components are sensitive to electrostatic discharge (ESD). The lifespan of assemblies containing such components can be drastically reduced by improper handling during maintenance and repair. Please observe the following rules when handling ESD sensitive components:

- ESD sensitive components should only be stored and transported in the packing material specifically provided for this purpose

- When performing a repair by replacing complete assemblies, the removed assembly must be sent back to the supplier in the same packing material in which the replacement assembly was shipped. If this should not be the case, any claim for a possible refund will be null and void
- Unpacked ESD sensitive components should only be handled in ESD protected areas (EPA, e.g. area for field service, repair or service bench) and only be touched by persons wearing a wristlet connected to the ground potential of the repair or service bench by a series resistor. The equipment to be repaired or serviced as well as all tools and electrically semi-conducting work, storage, and floor mats should also be connected to this ground potential
- The terminals of ESD sensitive components must not come in uncontrolled contact with electrostatically chargeable or metallic surfaces (voltage puncture, discharge shock hazard)
- To prevent the components from undefined transient stress and possible damage due to inadmissible voltages or compensation currents, electrical connections should only be established or separated when the equipment is switched off and after any capacitor charges have decayed

E Repair

By removing housing parts or shields, energized parts may be exposed. For this reason the following precautions must be observed:

- Maintenance may only be performed by trained personnel in accordance with the applicable regulations
- The equipment must be switched off and disconnected from the AC power outlet before any housing parts are removed
- Even if the equipment is disconnected from the power outlet, parts with hazardous charges (e.g. capacitors, picture tubes) must not be touched until they have been properly discharged. Do not touch hot components (power semiconductors, heat sinks, etc.) before they have cooled off
- If maintenance is performed on a unit that is opened while being switched on, no un-insulated circuit components and metallic semiconductor housings must be touched, neither with bare hands nor with un-insulated tools

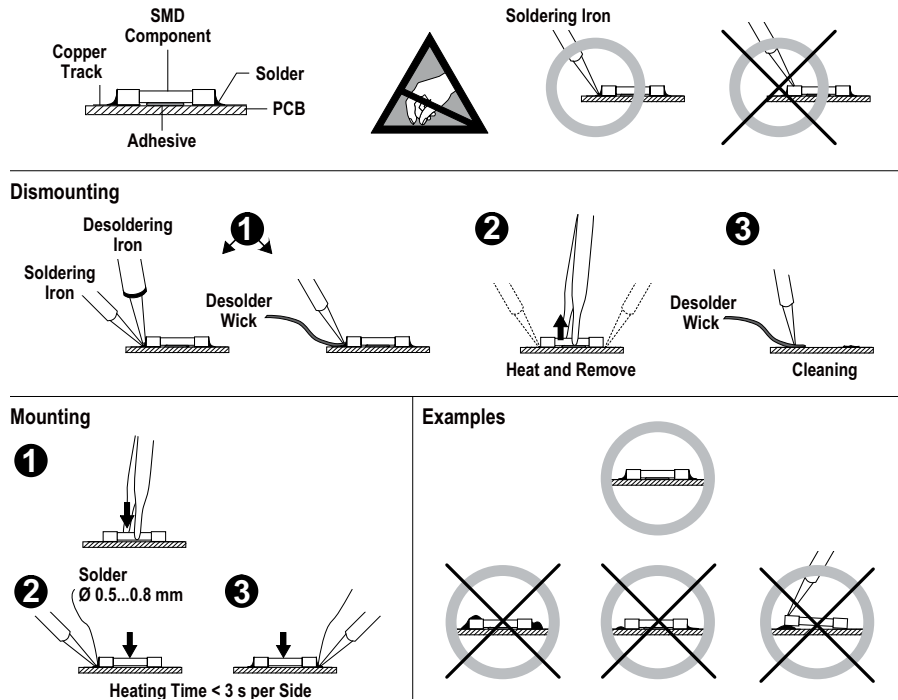
Certain components pose additional hazards:

- Explosion hazard from lithium batteries, electrolytic capacitors and power semiconductors (Observe the component's polarity. Do not short battery terminals. Replace batteries only by the same type)
- Implosion hazard from evacuated display units
- Radiation hazard from laser units (non-ionizing), picture tubes (ionizing).
- Caustic effect of display units (LCD) and components containing liquid electrolyte

Such components should only be handled by trained personnel who are properly protected (e.g. protection glasses, gloves)

E1 SMD Components

Studer has no commercially available SMD components in stock for service purposes. For repair, the corresponding devices have to be purchased locally. The specifications of special components can be found in the service manual. SMD components should only be replaced by skilled specialists using appropriate tools. No warranty claims will be accepted for circuit boards that have been damaged. Proper and improper SMD soldering joints are illustrated below.



F Disposal

Packing Materials

The packing materials have been selected with environmental and disposal issues in mind. All packing material can be recycled. Recycling packing saves raw materials and reduces the volume of waste. If you need to dispose of the transport packing materials, please try to use recyclable means.

Used Equipment

Used equipment contains valuable raw materials as well as materials that must be disposed of professionally. Please return your used equipment via an authorized specialist dealer or via the public waste disposal system, ensuring any material that can be recycled is. Please take care that your used equipment cannot be abused. To avoid abuse, delete sensitive data from any data storage media. After having disconnected your used equipment from the mains supply, make sure that the mains connector and the mains cable are made useless.

G Declarations of Conformity

G1 Class B Equipment - FCC Notice

Warning ! Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

G2 Industry Canada – IC Notice

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur d'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

The device and the antenna should be installed and operated with a minimum distance of 20 cm from all persons.

G3 CE Declaration of Conformity

We,
**Harman International Industries
Studer Professional Audio GmbH,
CH-8105 Regensdorf,**
declare under our sole responsibility that the product
**Studer Micro Series, compact OnAir and Production mixing system
(starting with serial no. 1001),**
to which this declaration relates, according to following regulations of EU
directives and amendments

- Low Voltage (LVD):
2014/35/EU
- Radio Equipment Directive (RED):
2014/53/EU
- Restriction of Hazardous Substances (RoHS2):
2011/65/EU

is in conformity with the following standards or normative documents:

- Safety:
EN 60065:2014
- RED:
EN 301 489-1 v2.0.0
EN 301 489-17 v3.2.0
EN 300 440 v2.1.1
EN 300 328 v2.1.1
EN 301 893 v2.1.1



M.Lienert, Manager R&D



BE

DK

DE

IE

ES

FR

IT

PT

NL

FI

SE

UK

Appendix 1: Air Temperature and Humidity

General

Normal operation of the unit or system is warranted under the ambient conditions defined by *EN 60721-3-3, set IE32, value 3K3*.

This standard consists of an extensive catalogue of parameters, the most important of which are: ambient temperature +5...+40 °C, relative humidity 5...85% (i.e., no formation of condensation or ice); absolute humidity 1...25 g/m³; rate of temperature change < 0.5 °C/min. These parameters are dealt with in the following paragraphs.

Under these conditions the unit or system starts and works without any problem. Beyond these specifications, possible problems are described below.

Ambient Temperature

Units and systems by Studer are generally designed for an ambient temperature range (i.e. temperature of the incoming air) of +5 °C to +40 °C. When rack mounting the units, the intended air flow and herewith adequate cooling must be provided. The following facts must be considered:

- The admissible ambient temperature range for operation of the semiconductor components is 0 °C to +70 °C (commercial temperature range for operation)
- The air flow through the installation must provide that the outgoing air is always cooler than 70 °C
- Average heat increase of the cooling air shall be about 20 K, allowing for an additional maximum 10 K increase at the hot components
- In order to dissipate 1 kW with this admissible average heat increase, an air flow of 2.65 m³/min is required

Example: A rack dissipating $P = 800 \text{ W}$ requires an air flow of $0.8 * 2.65 \text{ m}^3/\text{min}$ which corresponds to $2.12 \text{ m}^3/\text{min}$.

- If the cooling function of the installation must be monitored (e.g. for fan failure or illumination with spot lamps), the outgoing air temperature must be measured directly above the modules at several places within the rack. The trigger temperature of the sensors should be 65 °C to 70 °C

Frost and Dew

The unsealed system parts (connector areas and semiconductor pins) allow for a minute formation of ice or frost. However, formation of dew visible to the naked eye will already lead to malfunctions. In practice, reliable operation can be expected in a temperature range above –15 °C, if the following general rule is considered for putting the cold system into operation:

If the air within the system is cooled down, the relative humidity rises. If it reaches 100%, condensation will arise, usually in the boundary layer between the air and a cooler surface, together with formation of ice or dew at sensitive areas of the system (contacts, IC pins, etc.). Once internal condensation occurs, trouble-free operation cannot be guaranteed, independent of temperature.

Before putting into operation, the system must be checked for internal formation of condensation or ice. Only with a minute formation of ice, direct

evaporation (sublimation) may be expected; otherwise the system must be heated and dried while switched off.

A system without visible internal formation of ice or condensation should be heated up with its own heat dissipation, as homogeneously (and subsequently as slow) as possible; the ambient temperature should then always be lower than the one of the outgoing air.

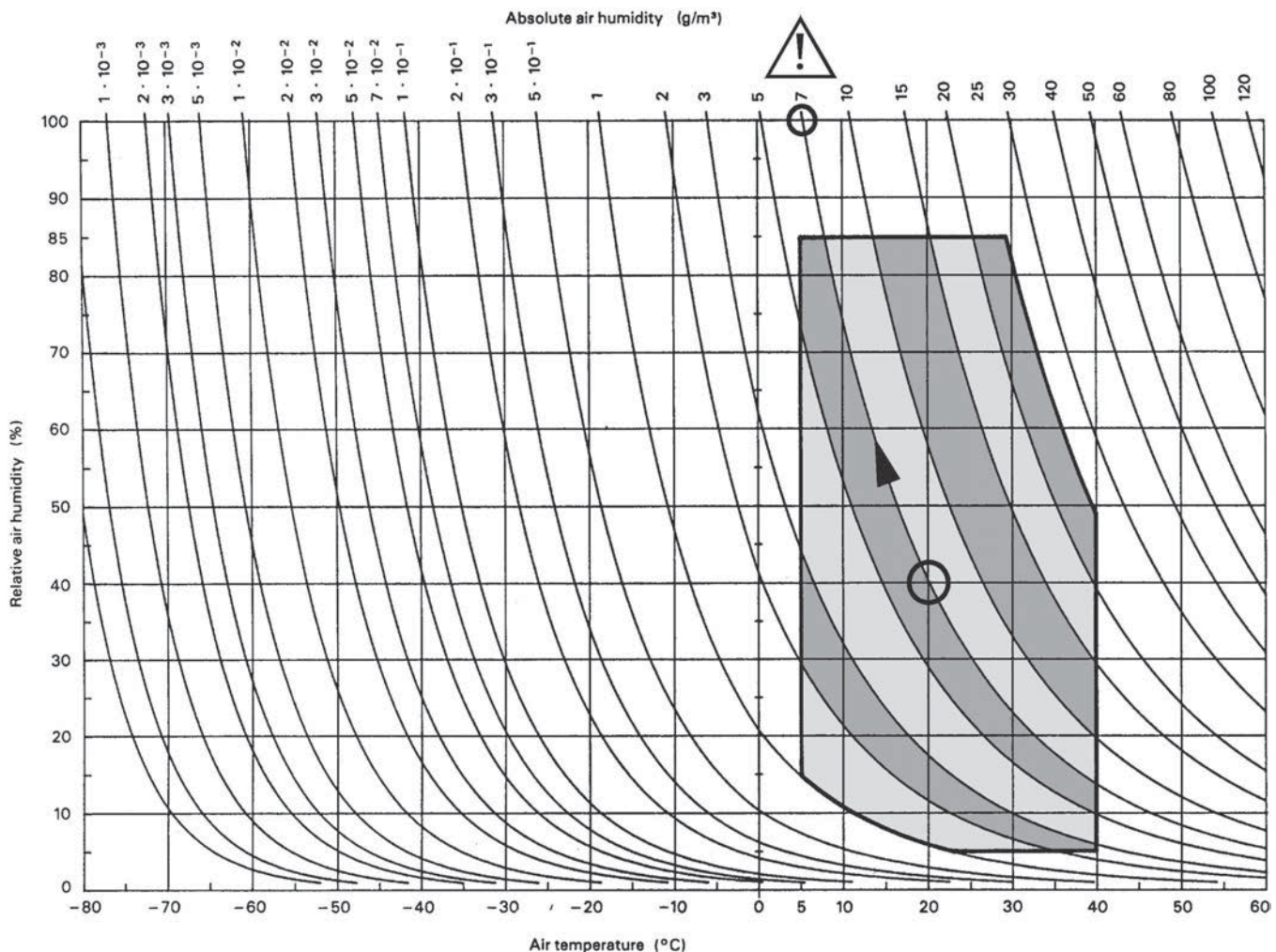
If it is absolutely necessary to operate the cold system immediately within warm ambient air, this air must be dehydrated. In such a case, the absolute humidity must be so low that the relative humidity, related to the coldest system surface, always remains below 100%.

Ensure that the enclosed air is as dry as possible when powering off (i.e. before switching off in winter, aerate the room with cold, dry air, and remove humid objects such as clothes from the room).

These relationships are visible from the following climatogram. For a controlled procedure, thermometer and hygrometer as well as a thermometer within the system will be required.

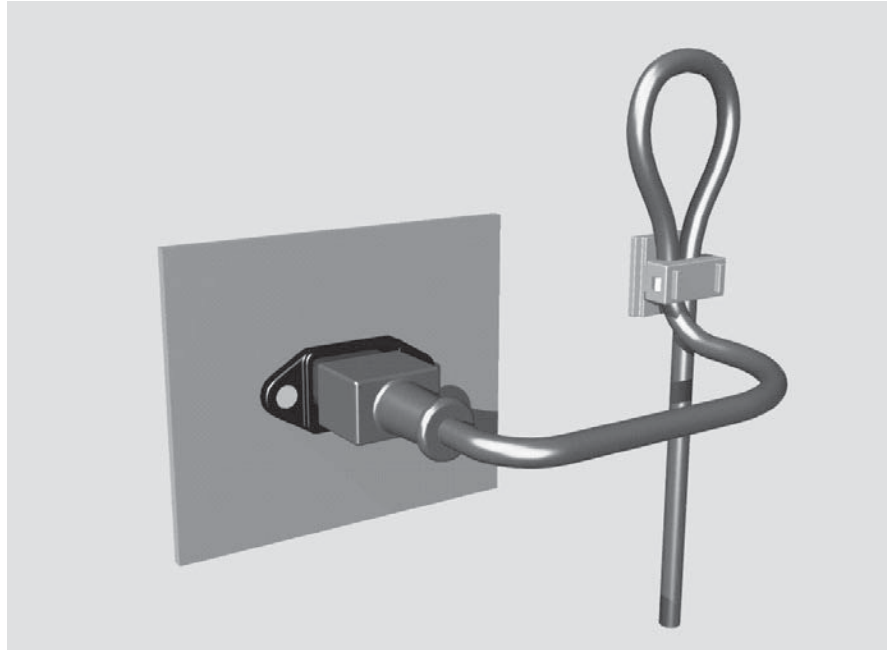
Example 1: An OB-van having an internal temperature of $+20\text{ }^{\circ}\text{C}$ and a relative humidity of 40% is switched off in the evening. If the temperature falls below $+5\text{ }^{\circ}\text{C}$, the relative humidity will rise to 100% (7 g/m^3); dew or ice will be forming.

Example 2: An OB-van is heated up in the morning with air of $+20\text{ }^{\circ}\text{C}$ and a relative humidity of 40% . On all parts being cooler than $+5\text{ }^{\circ}\text{C}$, dew or ice will be forming.



Appendix 2: Mains Connector Strain Relief

For anchoring connectors without a mechanical lock (e.g. IEC mains connectors), we recommend the following arrangement:



- Procedure:** The cable clamp shipped with your unit is auto-adhesive. For mounting please follow the rules below:
- The surface to be adhered to must be clean, dry, and free from grease, oil, or other contaminants. Recommended application temperature range is +20 °C to +40 °C
 - Remove the plastic protective backing from the rear side of the clamp and apply it firmly to the surface at the desired position. Allow as much time as possible for curing. The bond continues to develop for as long as 24 hours
 - For improved stability, the clamp should be fixed with a screw. For this purpose, a self-tapping screw and an M4 bolt and nut are included
 - Place the cable into the clamp as shown in the illustration above and firmly press down the internal top cover until the cable is fixed

Appendix 3: Software License

Use of the software is subject to the Studer Professional Audio Software License Agreement set forth below. Using the software indicates your acceptance of this license agreement. If you do not accept these license terms, you are not authorized to use this software.

Under the condition and within the scope of the following Terms and Conditions, Studer Professional Audio GmbH (hereinafter ‘Studer’) grants the right to use programs developed by Studer as well as those of third parties which have been installed by Studer on or within its products. References to the license programs shall be references to the newest release of a license program installed at the Customer’s site.

Programs Covered by the Agreement

License Programs of Studer The following Terms and Conditions grant the right to use all programs of Studer that are part of the System and/or its options at the time of its delivery to the Customer, as well as the installation software on the original data disk and the accompanying documentation (‘License Material’). In this Agreement the word ‘Programs’ shall have the meaning of programs and data written in machine code.

Using the software indicates your acceptance of this license agreement. If you do not accept these license terms, you are not authorized to use this software.

Programs of Third Parties Programs of third parties are all programs which constitute part of the System and/or its options at the time of delivery to the Customer but have not been developed by Studer. The following conditions are applicable to programs of third parties:

- The right to use third parties’ programs is governed by the License Agreement attached hereto (if applicable), which is an integral part of this Agreement. The Customer shall sign any and all License Agreements for all further programs of third parties installed on the system. The Customer shall be deemed to have received all License Agreements upon delivery of the system and/or its options
- Studer shall accept no responsibility or liability for, and gives no warranties (express or implied) as to the programs of third parties. The Customer waives any and all claims versus Studer for any consequential damages, which might occur due to defects of these programs

Right of Use

Principle Studer grants the Customer the non-exclusive right to use the License Material in one copy on the system and/or its options as laid down by the Sales Agreement concluded between the parties and all Terms and Conditions which shall be deemed to form and be read and construed as part of the Sales Agreement. This right is assignable according to the ‘Assignability’ paragraph hereinafter.

Customized Configurations The Customer is not entitled to alter or develop further the License Material except within the expressly permitted configuration possibilities given by the software installed on the system or elsewhere. All altered programs, including but not limited to the products altered within the permitted configuration possibilities, are covered by this License Agreement.

- Reverse Engineering** Reverse engineering is only permitted with the express consent of Studer. The consent of Studer can be obtained but is not limited to the case in which the interface software can not be provided by Studer. In any case Studer has to be informed immediately upon complete or partial reverse engineering.
- Copying the License Material** The Customer is entitled to make one copy of all or parts of the License Material as is necessary for the use according to this Agreement, namely for backup purposes. The Customer shall apply the copyright of Studer found on the License Material onto all copies made by him. Records shall be kept by the Customer regarding the amount of copies made and their place of keeping. The responsibility for the original program and all copies made lies with the Customer. Studer is entitled to check these records on first request. Copies not needed anymore have to be destroyed immediately.
- Disclosure of License Material** The License Material is a business secret of Studer. The Customer shall not hand out or in any way give access to parts of or the complete License Material to third parties nor to publish any part of the License Material without prior written consent of Studer. The Customer shall protect the License Material and any copies made according to the paragraph above by appropriate defense measures against unauthorized access. This obligation of non-disclosure is a perpetual obligation.
Third parties are entitled to have access to the License Material if they use the License Material at the Customer's site in compliance with this Agreement. Under no circumstance are third parties entitled to have access to the installation software on the original data media. The Customer shall safeguard the original data media accordingly.
- Assignability** The rights granted to the Customer according to this License Agreement shall only be assignable to a third party together with the transfer of the system and/or its options and after the prior written consent of Studer.

Rights to License Material

With the exception of the right of use granted by this License Agreement all proprietary rights to the License Material, especially the ownership and the intellectual property rights (such as but not limited to patents and copyright) remain with Studer even if alterations, customized changes or amendments have been made to the License Material.

Studer's proprietary rights are acknowledged by the Customer. The Customer shall undertake no infringements and make no claims of any patent, registered design, copyright, trade mark or trade name, or other intellectual property right.

Warranty, Disclaimer, and Liability

For all issues not covered herewithin, refer to the 'General Terms and Conditions of Sales and Delivery' being part of the sales contract.

MICRO SERIES

1	System Description	3
1.1	Introduction	3
1.2	Hardware	3
1.2.1	Micro Core	3
1.2.1.1	Front side connectors	4
1.2.1.2	Front side status LEDs	4
1.2.1.3	Rear side connectors	5
1.2.1.4	Mains Power	5
1.2.2	Micro Fader	6
1.2.2.1	Operating Elements	6
1.2.2.2	Connectors	7
1.2.2.3	iPad mount	7
1.3	Main Features	8
1.4	How can it be operated	8
1.4.1	GUI	8
1.4.2	Micro Fader	8
1.5	Hookup possibilities via Network	9
1.6	Hookup possibilites direct GUI Control	10
1.7	Applications	11
1.7.1	Hookup Diagram Application 1 - Radio OnAir Production	11
1.7.2	Hookup Diagram Application 2 - TV OnAir Production	12
1.7.3	Hookup Diagram Application 3 - Post Production	13
2	GUI Operation	14
2.1	L1 - The operation level (for DJs)	14
2.1.1	Main Page	14
2.1.2	Mixer Channels	16
2.1.2.1	Channel Roles	16
2.1.3	Chan View	17
2.1.4	Send View	20
2.1.5	Sum View	21
2.1.6	Play(er) View	22
2.1.6.1	Track Player Operation	23
2.1.6.2	Jingle Player Operation	25
2.1.7	Meter View	27
2.1.8	Central Section	28
2.1.9	Right Section	29
2.1.9.1	USB Recorder	30
2.1.9.2	User Snapshots	32
2.1.9.3	TB External	34
2.2	L2 - The options level	35
2.2.1	Channel options	35
2.2.2	Bus options	38
2.2.3	Meter options	40
2.2.4	Snapshot options	40

2.2.5	CR Monitoring options	41
2.2.6	Guest Monitoring options	42
2.3	L3 - The configuration level	43
2.3.1	Channel config	43
2.3.2	Bus Config	54
2.3.3	CR Monitoring Config	59
2.4	Settings view	63
3	Setup	83
3.1	Setting up the Network	83
3.2	Setting up the Micro Fader modules	83
3.3	Setting up the Monitoring	84
3.4	Setting up TB	86
3.5	Setting up N-1 / Sends	87
3.6	Setting up GPIOs	87
3.7	Setting up Dante	89
3.8	Firmware update	89
3.9	Emergency factory reset	90
4	Blockdiagram	91
5	Technical Specifications	92
6	Glossary	93

1 SYSTEM DESCRIPTION

1.1 Introduction

The Studer Micro Series is a compact OnAir broadcast and production mixing system.

It has been designed with focus on very easy operatability - whilst providing features for professional broadcast production, which are normally only found in more complex OnAir mixers.

Eventough it has specific OnAir features, it can also be used as a versatile production mixer for many other applications.

The Studer Micro Series can currently be used as a standalone unit, and later it will have the functionality to be part of a networked studio environment.

The minimal system consists of a base unit only which is called Micro Core. The Micro Core is then operated via a browser GUI, which can be run on a tablet, notebook or desktop computer. (iOS, Android, Windows, MacOS, and Linux platforms are supported).

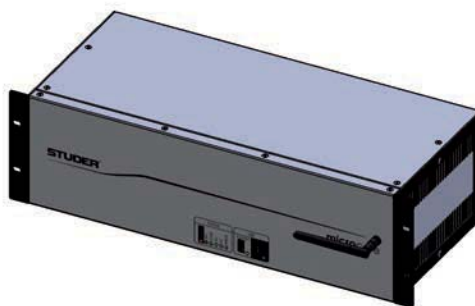
For local operation, a computer screen and mouse and keyboard can be directly connected to the Micro Core to operate the GUI.

For users who wish dedicated hardware controls, the Micro Core can be combined with one or two desk modules - adding faders, buttons and channel displays for real hands-on control. The desk module is called Micro Fader.

This manual is written for users that operate the mixer - and also for setup and installation of the mixer (last part in the manual).

1.2 Hardware

1.2.1 Micro Core



The heart of the Micro Series is the fanless, rackmountable 3 RU Micro Core. It is the actual mixing engine, also providing USB connectivity and status LEDs on the front side, and audio I/O as well as a multitude of other connectors on the rear side.

By using the included rackmount-kit, the Micro Core can also be mounted in “reversed” way , making it easier to access all audio I/Os from the front of the rack.

1.2.1.1 Front side connectors

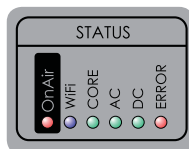
USB for logging (not enabled in SW V1.0)
 USB for playback and recording
 WLAN antenna (not enabled in SW V1.0)



The LED next to the playback and recording USB port becomes green after the inserted media has been performance-tested and is ready for operation.

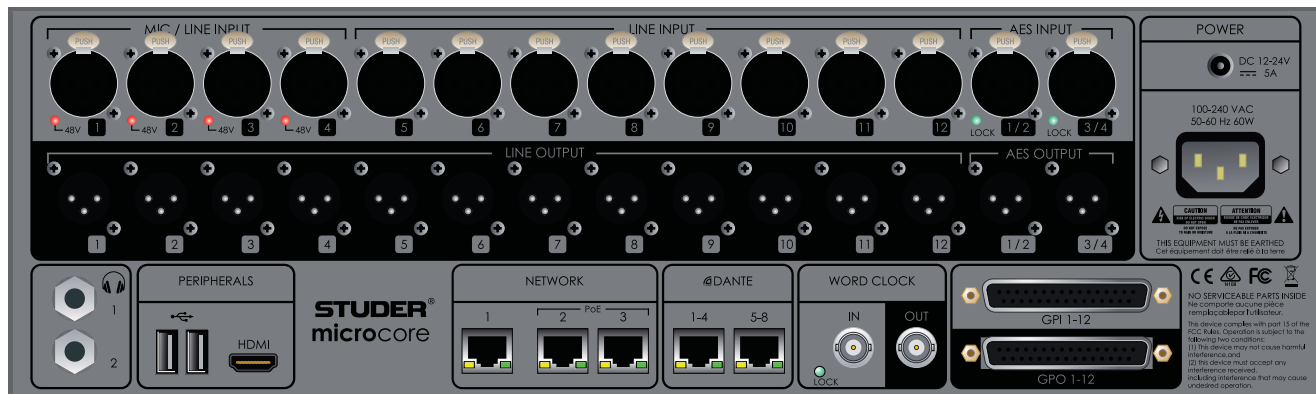
1.2.1.2 Front side status LEDs

The Core Status indication LEDs are described in the table below.



Status	Colour	Description
Power AC	Green	AC Power OK
Power DC	Green	DC Power OK
Core Ready	Green	Core started up and ready for operation
Error	Red	The system detected an error or warning. Refer to the Error Status page for more details.
Wi-Fi	Blue	Illuminated as long as Wi-Fi is active
OnAir	Red	Illuminated if the Micro Core is onair. For details refer to chapter 2.1.8 OnAir Red Light Indication .

1.2.1.3 Rear side connectors



Discrete audio inputs	4 x balanced HQ Mic/Line inputs on XLR 8 x balanced Line inputs on XLR 2 x AES3 with SFC on XLR
Discrete audio outputs	12 x balanced line out XLR 2 x AES3 on XLR 2 x stereo headphones
Networked audio I/O	2 x AES67/Dante (4 audio channels each)
Other connectors	Mains power DC Power Word Clock In and Out GPIO Ethernet HDMI and 2x USB for GUI 2x RJ45 including PoE for Micro Fader modules

1.2.1.4 Mains Power

The Micro Core is primarily powered by an integrated wide-range AC power supply with IEC type standard connector. For mobile use (automotive battery) or power redundancy an additional DC power input with lockable connector can also be found just above the AC connector.

1.2.2 Micro Fader

Up to two Micro Fader modules can be connected to one Micro Core - giving access to up to 12 faders. This allows professional Radio OnAir operation. Connection is via a single cat5 cable for communication protocol and power.

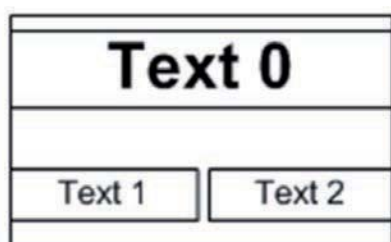


1.2.2.1 Operating Elements

There are six non-motorized faders. Each channel strip has its own display. Per channel strip, two small option buttons are placed directly below the display. Further down, two large buttons are placed above the fader. These buttons are used for Rec and Cue functions. Then below the fader there are another two large buttons: the On- and the PFL /Off button.

Also a signal indication- as well as an overload LED are placed between the fader and the upper two large buttons.

Display The Micro Fader module provides a two row LCD display to indicate :



- the eight character channel label on the first row (Text 0),
- the functions of the channel specific buttons on the second row. (The background of the function name is inverted when the function is active.)
- Channel On-Master status, by changing the backlight colour from white (default) to blue. The backlight is flashing if a channel that is On-Master is pending on snapshot parameter recall.

Buttons The Micro Fader module features six buttons per channel strip. From top to bottom of the strip, they have the following functions :

- Two small buttons directly underneath the display. Their functions are shown on the lower row of the display. (Text 1 and Text 2)
- The **REC** button is the same as the **REC** button in the GUI. This button contains one yellow LED. The OffAir Record function is indicated yellow.
- The **CUE/Blank** button. This button contains two LEDs, red and yellow. (The CUE function is indicated yellow).
- The **ON** button is the same as the **ON** button in the GUI. This button contains two LEDs, red and yellow. The Channel ON status is indicated red.
- The **PFL/OFF** button. This button contains two LEDs, red and yellow. The PFL function is indicated yellow, the OFF function not illuminated.

Except for the **REC** button and the **ON** button, the buttons can represent different functions.

Faders Each Micro Fader module features six none motorized faders at 36mm pitch. Because the faders are not motorized, there is the need for an Auto Takeover mechanism that is an aid to manually synchronise fader positions between GUI and physical faders. Auto Takeover indication is on the channel strip display, on the upper row (Text0).

Auto Takeover Auto Takeover works like this :
 When the position of the physical fader differs from the fader value in the GUI, the channel's display indicates this by showing either **FADER UP** or **FADER DOWN**. This is a request to the operator, to touch the fader and move it to the identical position that the fader value has in the GUI. This can be done very easily, without looking at the GUI.
 As soon as the fader is touched, the display shows a value. This value is followed by the word **UP** or **DOWN**. This means that the fader must be moved the value in dB's up or down to match the current fader value of the GUI. The larger the value, the longer the way that the fader needs to be moved until the current fader value is met. Since the value is being updated while the fader is moved, it is easy to fade to the area where the value becomes 0. Once the fader is there, the display indicates that Auto Takeover is complete for this channel, by showing the word **TAKEOVER**, which will be flashing for a couple of seconds.
 This procedure must be carried out for every channel that is assigned to a physical fader of a Micro Fader module, where the channel strip's display shows **FADER UP** or **FADER DOWN**.

LEDs **OVL** : A red LED indicating analogue clipping.
SIG: A green LED indicating the signal after the **INPUT** processing block.

1.2.2.2 Connectors

The Micro Fader module features two connectors on the rear side.



One RJ45-connector where the connection to the Micro Core is made. And one USB connector that can be used to power an optional iPad.

1.2.2.3 iPad mount

An iPad can be mounted on the top rim of the Micro Fader module. This is optional.
 The iPad displays the normal Micro Series GUI.

1.3 Main Features

The Studer Micro Series mixer is fully loaded with mixer functionality :

- 12 DSP channels with HPF, EQ, De-Esser, Compressor, Noise Gate and **Automatic Gain Control**
- 1 x Stereo Program Bus with Brickwall Limiter
- 1 x Stereo Record Bus with Brickwall Limiter
- 4 x Stereo Send Bus (Aux or N-1) with Brickwall Limiter
- 1 x Stereo PFL Bus
- Input- and output routing
- Internal test signal generator
- Off Air Recording
- Main Level Meters
- Track Player with Playlist
- Jingle Player
- Monitoring with DJ- and Guest Headphone outputs
- Talkback
- Time and Watch
- Configurable GPIOs for faderstart, etc.
- User Snapshots
- User Access Privileges

1.4 How can it be operated

The Micro Core has an integrated webserver, which allows any computer that is able to run HTML5 pages on its webbrowser to control the Micro Core. There is no need to install any drivers or applications. The only requirement is a network connection to the Micro Core - this can either be via wireless LAN or via a wired LAN connection to the Micro Core's Ethernet port. Once the webbrowser has been directed to the Micro Core's IP address, the control screen is loaded and control elements which are optimized for touch-screens with multitouch-operation allow to control the mixer.

Note : For browser control of the Micro Core, cookies must be enabled.

1.4.1 GUI

The entire functionality of the Micro Series can be controlled from the GUI (Graphical User Interface) running on a webbrowser, as described above, or through local connected screen, keyboard and mouse.

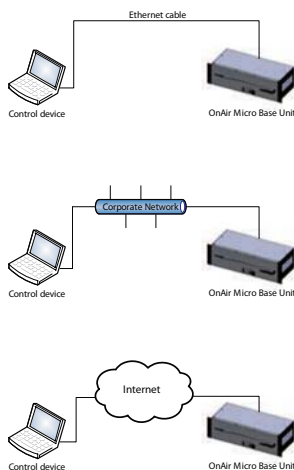
Note : GUI on iPad Please don't use Mozilla Firefox or Chrome browsers on the iPad, as they both don't support full screen mode. Use the Safari browser instead, and create a Home Screen Icon, which opens the browser in full screen mode.

1.4.2 Micro Fader

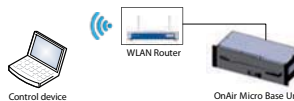
In addition to the GUI, one or two hardware Micro Fader modules can be connected to the Micro Core. This provides hardware faders and buttons for those operators who wish full tactile control of the Micro Series mixer.

1.5 Hookup possibilities via Network

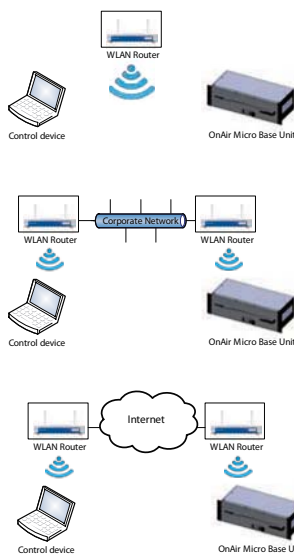
Ethernet A very secure way to control the Micro Core is to use a wired LAN connection. An ethernet cable between your control PC/Laptop and the Micro Core's network port 1 is all that is needed. This connection can also be made via a corporate network, or even via Internet.



Of course the Micro Core can also be controlled by a wireless device when connecting an external WLAN router to the Micro Core's network port.



WLAN The Micro Core has an internal Wi-Fi port, allowing to join any existing WLAN. Once the control device (PC/Laptop/Tablet) also has access to the same WLAN, it is able to control the Micro Core.

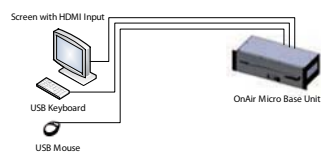


Internal Hotspot The Micro Core is able to produce its own WLAN, or with other words, it has its own WirelessAccessPoint (WAP). A control device can then simply join this WLAN and will be able to control the Micro Core without the need of any external network components.



1.6 Hookup possibilites direct GUI Control

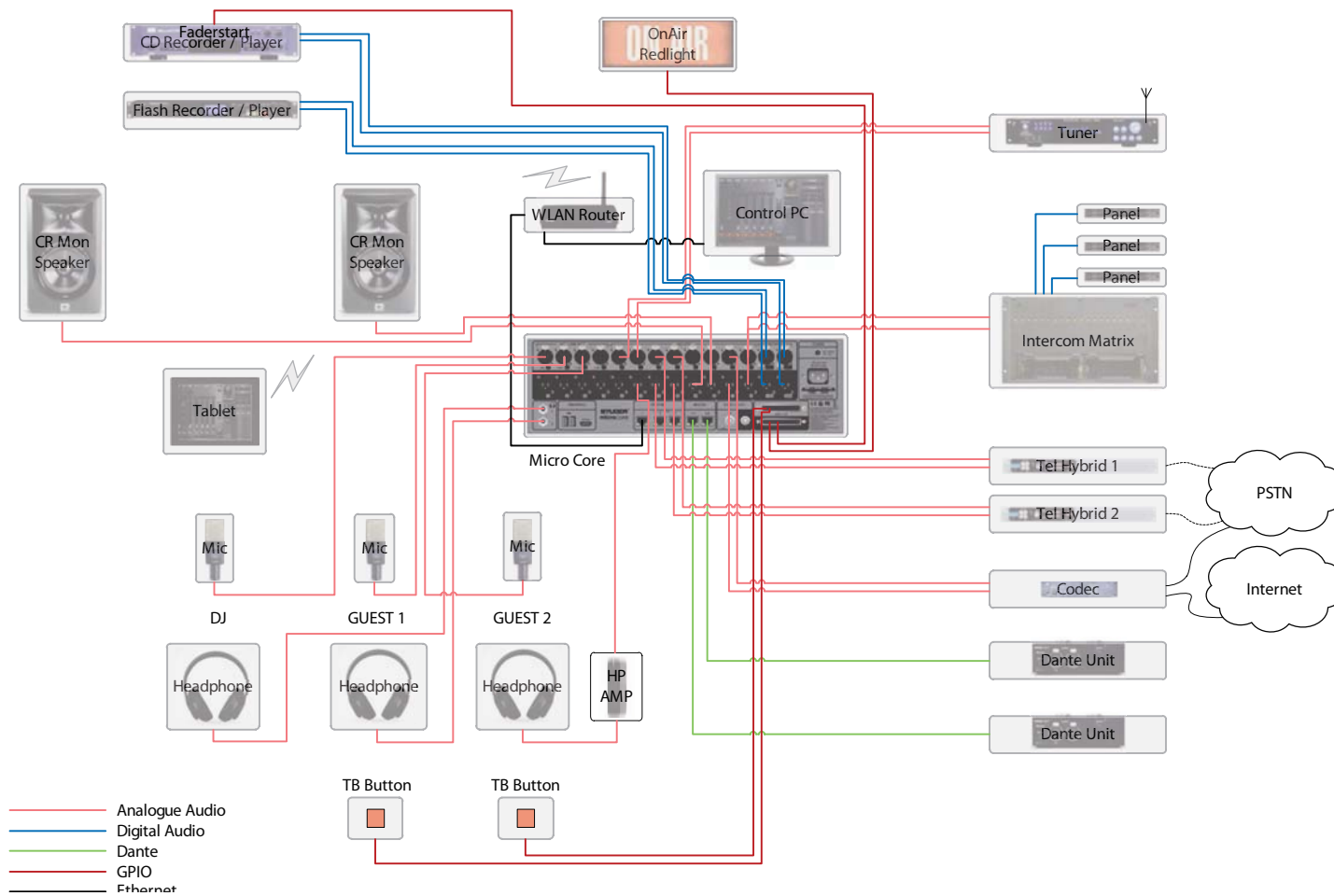
The simplest way of controlling the Micro Core is using the peripheral interface where a screen and mouse and keyboard can be connected, without any network in between.



Note : Please pay attention that the external screen with HDMI input is able to show the full image, and no 'overscan' is applied.

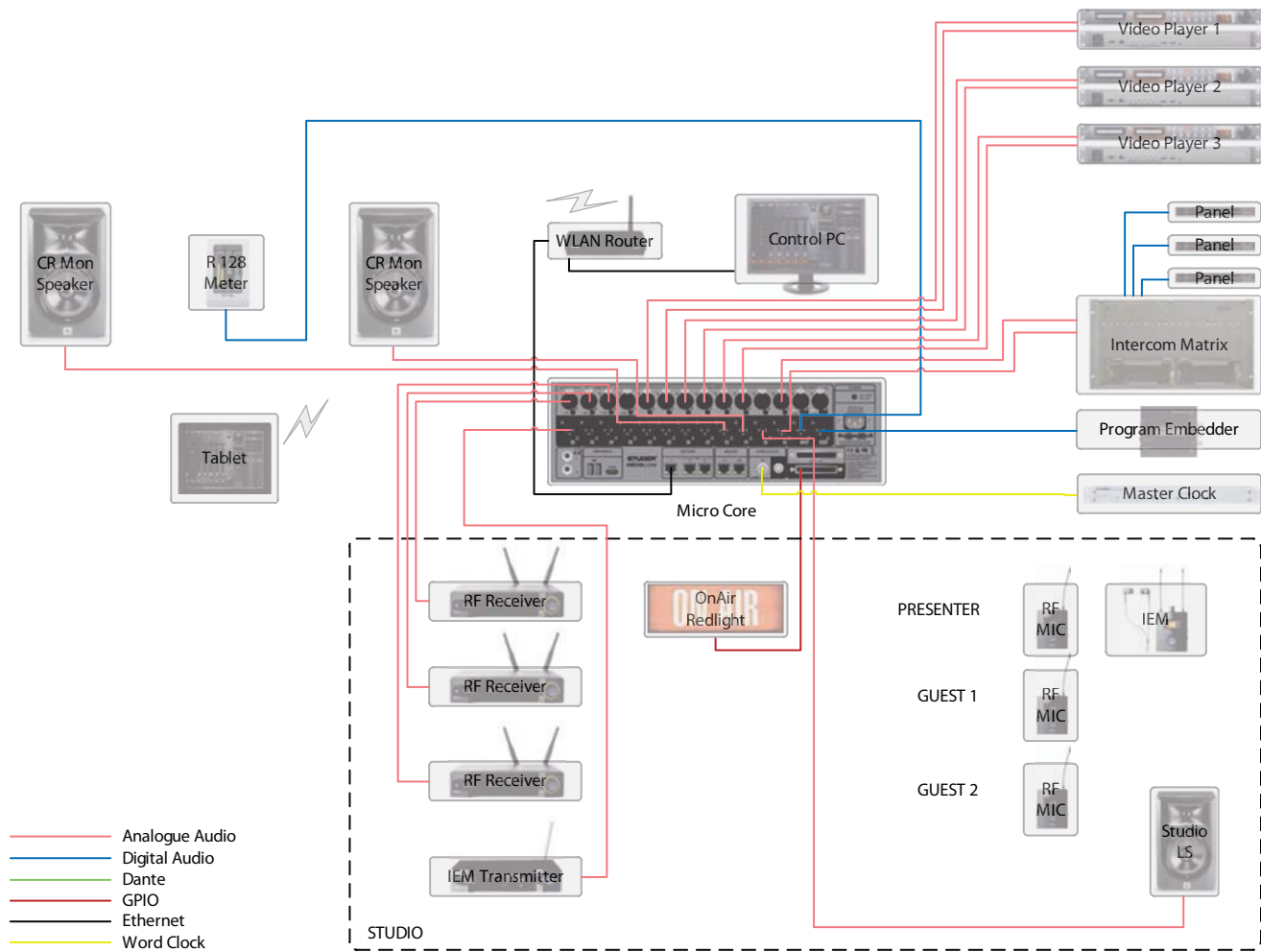
1.7 Applications

1.7.1 Hookup Diagram Application 1 - Radio OnAir Production



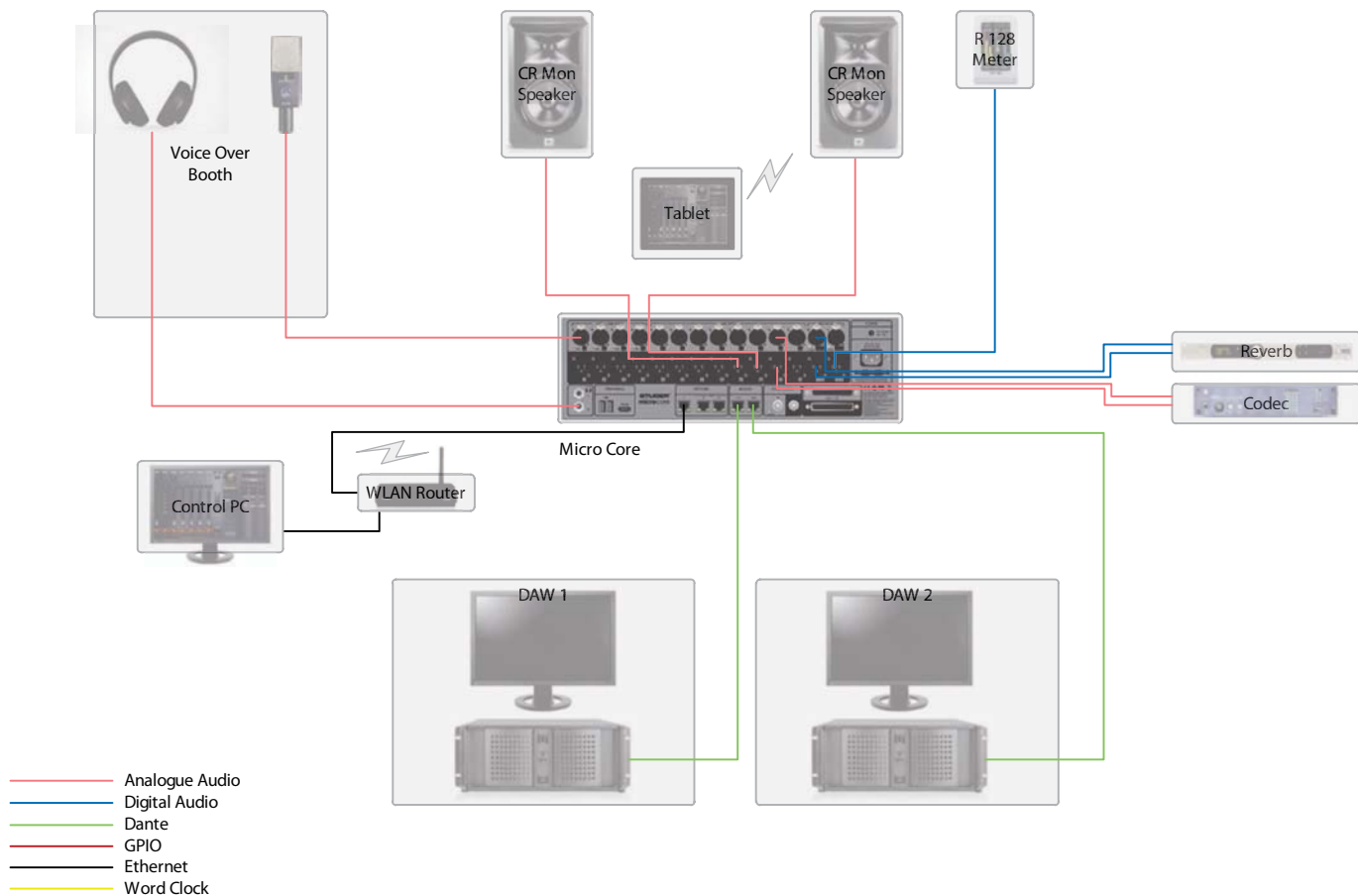
The diagram above shows an example of how the Micro Core could be connected in a typical OnAir Radio production environment.

1.7.2 Hookup Diagram Application 2 - TV OnAir Production



The diagram above shows an example of how the Micro Core could be connected in a typical TV production environment.

1.7.3 Hookup Diagram Application 3 - Post Production



The diagram above shows an example of how the Micro Core could be connected in a typical Post Production environment.

2 GUI OPERATION

The GUI operation concept of the Micro Series is organized in three levels :

- L1 - Operations level
- L2 - Options level
- L3 - Configuration level

- L1** The Operation level is the top page of the GUI. Here, all controls which are needed for a DJ to run a live radio show are easily accessible.
- L2** The Options level only shows the options of one specific channel. It is opened by double-clicking (or touching) the channel's label.
- L3** The Configuration level is entered by using the Config button. Then the Config view is shown, which consists of several pages.

In the following chapters, all three levels are described.

2.1 L1 - The operation level (for DJs)

2.1.1 Main Page

For basic DJ operation, all necessary control elements can be found on the Main page of the GUI. The Main page consists of three sections :

- Left section
- Central section
- Right section (Watch and Metering/Monitoring)



Left section

Central section

Right section

Left Section The left section of the GUIs operation view displays the control elements that are selected by the view buttons in the central section. This section is the main working surface for the DJ.

Central Section The section in the middle of the GUI provides the view buttons, elements for navigation, the OnAir indication, as well as the button to access the mixer settings.

Right Section The right section of the GUIs operation view displays control elements for Watch, Recording, Snapshot handling, Metering and Monitoring

2.1.2 Mixer Channels

Before the channel view is explained, it is essential to understand the concept of having different channel roles.

2.1.2.1 Channel Roles

All twelve DSP channels are identical. But every channel can be given a specific “role”. The role links specific functionality and operating elements to a channel, in order to make it capable of a specific task.

The following channel roles can more or less freely be used :

Channel Role	Description	Additional Buttons	Specific Input
Default	for a simple input channel, no special behaviour		
DJ	for a mic source located in the control room (CR)	Mute	
Guest	for a mic source located in the control room (CR)	Talk	
Input for sends 1	the bus owner of a N-1 bus	Talk	
Input for sends 2	the bus owner of a N-1 bus	Talk	
Input for sends 3	the bus owner of a N-1 bus	Talk	
Input for sends 4	the bus owner of a N-1 bus	Talk	
Track	for the input channel that is linked to the Track Player	Next, Display	Is linked to USB In 3/4
Jingle	for the input channel that is linked to the Jingle Player	Jingle buttons	Is linked to USB In 1/2

Already in the factory-reset state of the mixer, the channels have different roles.

Channel Number	Channel Role after Factory- reset	Channel Label	Channel Source
1	DJ	DJ MIC	HQ MIC/LINE #1
2	Guest	GUEST 1	HQ MIC/LINE #2
3	Guest	GUEST 2	HQ MIC/LINE #3
4	Guest	GUEST 3	HQ MIC/LINE #4
5	Input for sends 1	PHONE 1	ANALOG LINE #9
6	Input for sends 2	PHONE 2	ANALOG LINE #10
7	Jingle	JINGLE	USB 1/2
8	Track	PLAYER	USB 3/4
9	Default	AES 1/2	AES 1/2
10	Default	LINE 1/2	ANALOG LINE 5/6
11	Default	LINE 3/4	ANALOG LINE 7/8
12	Default	NET	AES67/DANTE 1/2

Channel roles are configured in the Config View of a channel, under the Source tab.

Depending on the channel role, the channel view can vary, because of additional buttons that need to be operatable.

2.1.3 Chan View



The channel view shows the faderstrips of the mixers input channels. All twelve input channels are shown - by using the scroll buttons in the central section the operator can navigate to the desired faderstrips. Also swiping can be used on a touchscreen to navigate between the faderstrips.



The operating elements that are common to all channels are these (channel role "Default") :



[1] Label The channel label display shows the channels name. This name can be entered in the Options page of the channel. The labels background changes from grey to blue, when the channel is ,On-Master‘.

[2] Rec button The Rec button assigns a channel to the record bus.

[3] OVL Indicator The overload indicator is used to indicate analogue input clipping (A/D converter), which means overload is never illuminated for digital sources. For

channels with analogue inputs, OVL is illuminated as soon as the input level, before input calibration, reaches 0dBFS.

- [3] **SIG Indicator** The green signal indicator is illuminated as soon as the signal is > -40dB. The signal is captured after the INPUT processing block and therefore it is also influenced by the analogue gain as well as the digital input calibration of the channel.

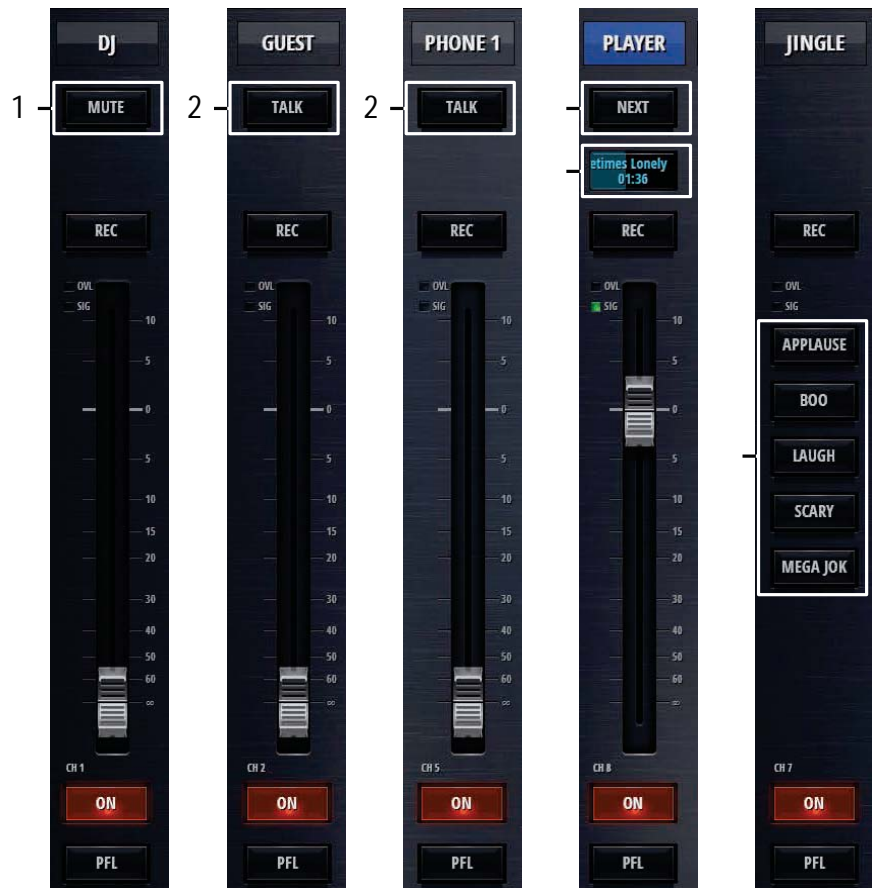
- [4] **Fader** The channel fader. It can be operated by mouse or touch. The mousewheel can also be used to operate the fader when hovering the mousepointer anywhere over the fader area.

- [5] **On button** The On button activates the channel. When the fader is open, the On button toggles the channel ,on-air' and ,off-air'.

- [6] **PFL button** The PFL button allows the operator to pre- listen to this channel even if the fader is closed or the channel is not switched to ,On'. PFL stands for PreF-adeListening. The Reset PFL button in the central section releases all channels from PFL.

The channel of other roles than “Default” have additional buttons :

Role : DJ Guest Input for sends Track Jingle

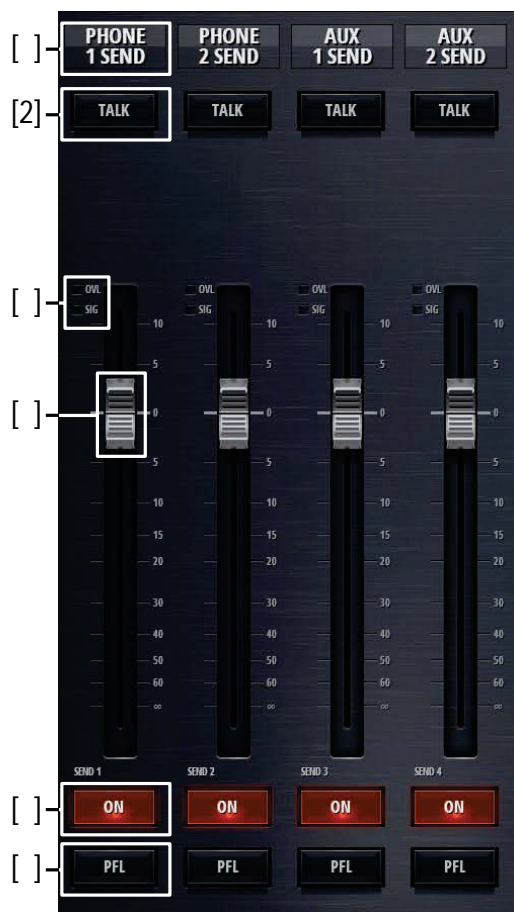


- [1] **Mute button** The Mute button is intended for the use as a cough-button. It is only available for channels of the role DJ.
- [2] **Talk button** The Talk button allows the DJ to talk either to a Guest via the Guest's head-phone monitor - or to a N-1 output of a channel of the role "Input for sends".
- [3] **Next button** The Next button allows to change to the next audio file of the current playing playlist. For details please see [chapter 2.1.6.1](#) Track Player Operation.
- [4] **Status Display** The Status Display of the Track Player Channel shows the name of the current title, as well as a progress bar and the current playing time.
- [5] **Jingle buttons** The Jingle buttons are used to play specific Jingles from the Jingle channel. More Jingle buttons can be found in the Play view.

2.1.4 Send View



The send view shows the mixers four send channels. Each of these four channels can either be an Aux or N-1 send. Here, the send master faders can be operated.



- [1] Label The label display shows the send channels name. This name can be entered in the Options page of the send channel.
- [2] Talk button This button can be used to talk to the output of this send channel.
- [5] SIG Indicator The green signal indicator is illuminated as soon as the signal on the send bus is $> -40\text{dB}$. The signal is captured before the send fader.
- [6] Fader The send fader. It can be operated by mouse or touch. The mousewheel can also be used to operate the fader when hovering the mousepointer anywhere over the fader area.
- [7] On button The On button activates the send channel.
- [8] PFL button The PFL button allows the operator to pre- listen to this channel even if the fader is closed or the channel is not switched to ,On'. PFL stands for PreF-adeListening. The Reset PFL button in the central section releases all channels from PFL.

2.1.5 Sum View



The sum view shows the master faders of the program (PRG) - as well as the recording (REC) bus .

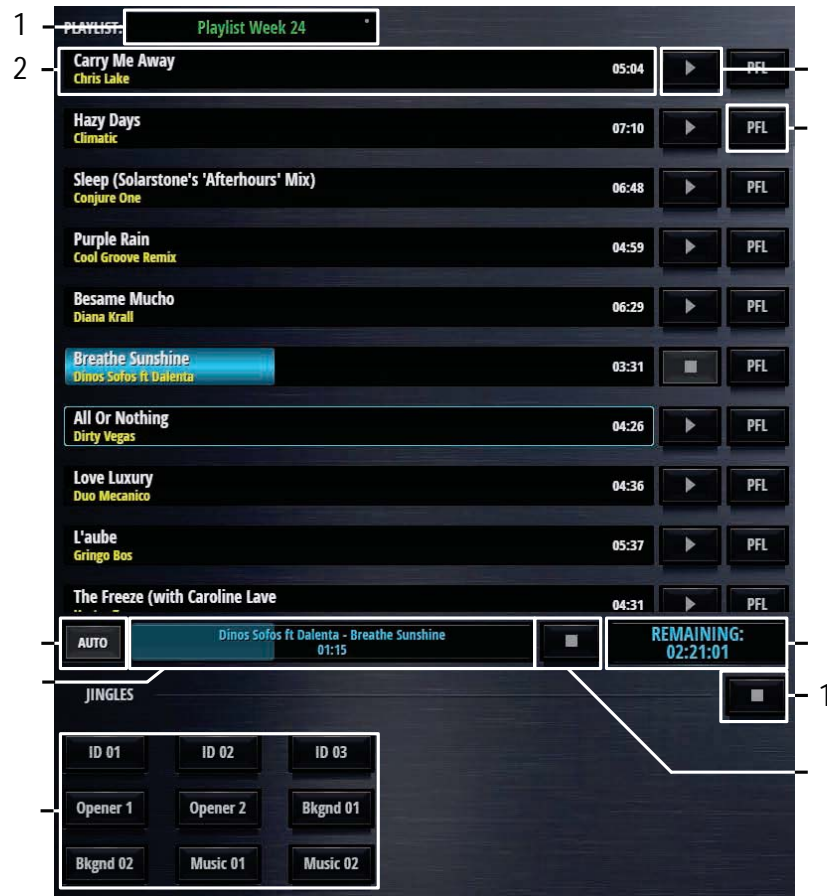


- [1] Label The label display shows the bus name. This name can be entered in the Options page of the bus.
- [5] SIG Indicator The green signal indicator is illuminated as soon as the signal is on the send bus is > -40dB. The signal is captured before the bus fader.
- [6] Fader The bus fader. It can be operated by mouse or touch. The mousewheel can also be used to operate the fader when hovering the mousepointer anywhere over the fader area.
- [8] PFL button The PFL button allows the operator to pre- listen to this bus even if the fader is closed. PFL stands for PreFadeListening. The Reset PFL button in the central section releases all channels from PFL.

2.1.6 Play(er) View



The play(er) view changes the left section to show the player window.



[1] Media Media and playlist selection.

[2] Title bars The title as well as the name of the artist is listed here. The blue progress bar shows the current position in the title. Also the total playing time is displayed at the end of the bar.

[3] Play mode Automatic or Manual player mode. The Play Mode defines the behaviour when on-air playback of a file reaches its end.

Manual If the file is played to its end before the Track Player Channel is closed or playback is stopped by the user, the Track Player Channel is turned to off.

Auto If a file is played to its end before the Track Player Channel is closed or playback is stopped by the user, playback of the currently selected audio file starts automatically from begin. In case of a playlist, the next file of the playlist starts automatically from begin. This allows playing all files of the selected playlist without further user action.

[4] Currently playing title display Displays the currently playing title as well as the current playing time. The blue progress bar shows the current position in the title.

[5] Play/Stop buttons Titles can be played and stopped directly with these dedicated play/stop buttons in the Player View.

Clicking or touching the Play button turns the Track Player Channel to On

and starts playback of a dedicated file from begin, regardless if any file is already playing or not. Note, that the fader must be open when using Play in order to make sure playback reaches program-, record and send buses. If the Stop button of a currently playing file is pressed, playback stops, the Track Player Channel is turned to Off.

[6] PFL buttons The PFL button is used to pre-listen the current selected audio file.

As long as the Track Player Channel is not open :

- Activating Channel PFL starts playback from the file begin
- Deactivating PFL stops playback

Note, that PFL is automatically deactivated, when the Track Player Channel reaches On-Master status.

If the file is played to its end before PFL is deactivated by the user, playback stops and PFL is turned off.

[7] Remaining time display Here, the remaining time of the playlist is displayed.

[8] Stop button Titles can be stopped directly with this global stop button.

[9] Jingle buttons The Jingle buttons are used to play specific Jingles from the Jingle channel. Here in the Player view, nine buttons are shown, where in the channel view depending on the size of the GUI, sometimes not all nine buttons can be shown.

[10] Stop button Jingles can be stopped directly with this global stop button.

2.1.6.1 Track Player Operation

Clicking or touching onto the Media field, opens up the media dialog.

This list shows :

- all known playlists, wherever they are on the USB stick
- all known audio files in the 'Media' folder
- all known audio files in the 'Recordings' folder

A playlist or an audio file can then be selected.

The following externally created playlists are supported :

File Extension	Description
.wpl	Windows Media Player Playlist
.m3u	Multimedia Playlist
.pla	Winamp Playlist
.pls	Text Based Multimedia Playlist

And the following audio file formats are supported :

Format	File Extension	Description
Wave	.wav	uncompressed audio
AAC	.aac	lossy audio compression
MP3	.mp3	lossy audio compression
Ogg Vorbis	.ogg	lossy audio compression
AIFF	.aif	uncompressed audio
FLAC	.flac	lossless audio compression

The Track Player is able to play a selected audio file or the audio files of a selected playlist.

The files are played back via the channel with the role “track”.

The Track Player is controlled on Operation Level L1 of the Track Player Channel through the following elements :

- FaderStart
- NEXT button
- PFL button
- PLAY/STOP buttons in the PLAY View
- GPIInput Function Track Player



FaderStart To start the Track Player via FaderStart, the channel ON button must be active, and the fader must be opened. Then, playback of the the currently selected audio file or the next file in the playlist starts from begin.

Closing the Track Player Channel will stop playback and re-positions to the file begin. In case of a playlist, the next file of the playlist will be positioned to its begin.

This allows playing all files of the selected playlist just by opening and closing the fader, or by turning the channel ON and OFF.

Next button The Next button operation works similar as activating FaderStart , with the the following difference - it can also be activated while a file is already playing and it doesn't stop playback. Therefore, the Next button function allows playback of the next file of the playlist without the need of manually stopping the currently playing file first.

Note, that the fader must be open when using the Next button in order to make sure playback reaches program-, record and send buses.

The Next button function is defined as follows:

During Stop:

When the Next button is activated while no playback is in progress, the Track Player Channel is turned to ON and playback of the currently selected audio file or the next file of the selected playlist starts from begin.

During Playback:

When the Next button is activated while playback is in progress, the current playback stops and playback of the next file of the selected playlist starts from begin.

In case of a selected file instead of a playlist, the currently selected file restarts playback from its begin.

PFL button When no track is playing, activating the Track Player Channels PFL button, the playback of the currently selected audio file is started and the Track Player Channel remains OFF. When a file is already playing, the Track Play Channels PFL can be activated, but then playback of the file is not interrupted nor will playback of this file be re-started.

Since there is only one instance of the Track Player, PFL of a track, while a different track is currently playing is not possible!

When no file is playing, any desired audio file can be prelistened in the Play View. This is done with the PFL button that is located at the and of each track next to the play button.

Playing order Usually the audio files of a playlist are played in the order they are defined by the list. Once a file is playing, there is a blue frame around the Title Bar

‘next file to be played’

of the file that will be played as next file. This file is marked as ‘next file to be played’. Without any interference of the operator, this file will be played when the current playing file has come to its end. If the operator decides, that a different file should be played as next file, she/he can long-click/touch on any other file in the playlist, whereupon the long-clicked file will be marked with the blue frame and becomes the next file to be played.

The next file to be played from the playlist is defined as follows :

- After selecting a new playlist, the first list item is the next file to be played.
- Each time, a file from the playlist starts playback, the subsequent file in the playlist is automatically selected as the next file to be played. After the last file from the playlist starts playback, the first file in the playlist is automatically selected as the next file to be played.

2.1.6.2 Jingle Player Operation

The Jingle Player supplies stereo audio playback through the inputs USB 1/2. Any channel that is configured to have these inputs as source is in the role “Jingle Player” and is used to control the playback of the jingles. Nine different jingle can be loaded which will then be available for playback through nine direct access buttons.

Audio files can be assigned to jingle buttons through the following file name conventions:

Jingle Player files must be located in the ‘Jingle’ folder of the USB storage media.

The filename begins with the character “J” followed by a one- or two digits button number 1..9 or 01...09.

The first eight characters of the filename are indicated on the jingle button. If the filename is more than eight characters long, the surplus characters are omitted.

The following audio file formats can be used for the Jingle Player :

Format	File Extension	Description
Wave	.wav	uncompressed audio
AAC	.aac	lossy audio compression
MP3	.mp3	lossy audio compression
Ogg Vorbis	.ogg	lossy audio compression
AIFF	.aif	uncompressed audio
FLAC	.flac	lossless audio compression

Example : J01_Logo 1.wav is the file that will be played when button 1 is pressed. The button will be labeled “Logo 1”.

J2Applaus.wav is the file that will be played when button 2 is pressed. This button will get the label “Applaus”.

The Jingle Player is controlled on Operation Level L1 of the Jingle Player Channel through the following elements :

- Jingle buttons in the channel start playback.
- Channel ON/OFF button of the channel to stop playback
- Jingle buttons in the PLAY View page to start playback
- STOP button in the PLAY View page to stop playback



Only one jingle can be played at the time. Starting another jingle stops the currently playing jingle and starts the next one.

The Jingle section in the PLAY View also shows all Jingle buttons and a Stop button.

**Starting
/Restarting a jingle**

Pressing a Jingle button triggers the following actions :

- stops any currently currently playing Jingle
- turns the Jingle Player channel to ON
- Starts playback of the associated Jingle file from begin

If PFL is active, the Jingle Player channel is set to OFF.

Stopping a jingle

A currently playing jingle can be stopped by either turning the Jingle Player Channel to OFF or pressing the STOP button in the Play View page.

Playback of a Jingle stops automatically at its end without any user action. When playback is stopped, the Jingle Player Channel is automatically switched to channel OFF.

Note 1 : If the Jingle Player Channel is set to ON, eventhough no Jingle is playing, the Jingle Player Channel is On Air.

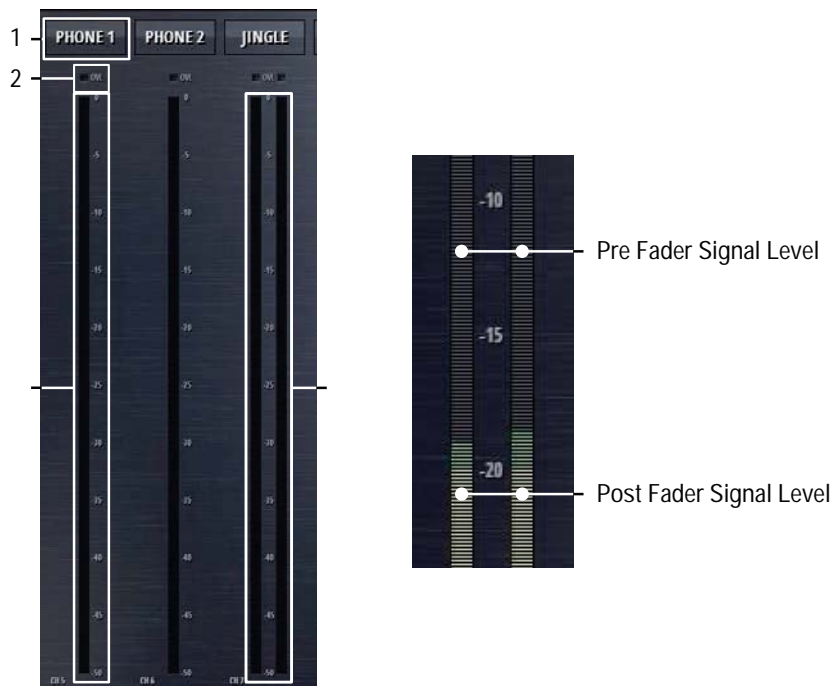
As in the GUI, there is no fader to this channel, the On Air state is simply activated by the channel ON/OFF button.

Note 2 : There is a difference to Micro Series mixers with connected Micro Fader modules. In the case of connected Micro Fader module, the Jingle Player Channel can have a fader - which then also has an effect on the On Air state of the Jingle Player Channel.

2.1.7 Meter View



The meter view shows the meter bargraphs of all input channels. Navigation is similar to navigating with the channel faders.



- [1] Label The label display shows the send channels name. This name can be entered in the Options page of the send channel.
- [2] OVL Indicator The overload indicator is used to indicate analogue input clipping (A/D converter), which means overload is never illuminated for digital sources. For channels with analogue inputs, OVL is illuminated as soon as the input level, before input calibration, reaches 0dBFS.
- [3] Mono Meter The meter of a mono input channel. The meter scale is digital with 0dBFS at the top.
- [4] Stereo Meter The meter of a stereo input channel. The meter scale is digital with 0dBFS at the top.
- Pre/Post level metering The level bargraph indicates pre- and post fader signal level at the same time. The pre fader signal level is indicated in the background as a blue bar. The post fader signal level is indicated in the foreground, covering the pre fader signal.

2.1.8 Central Section

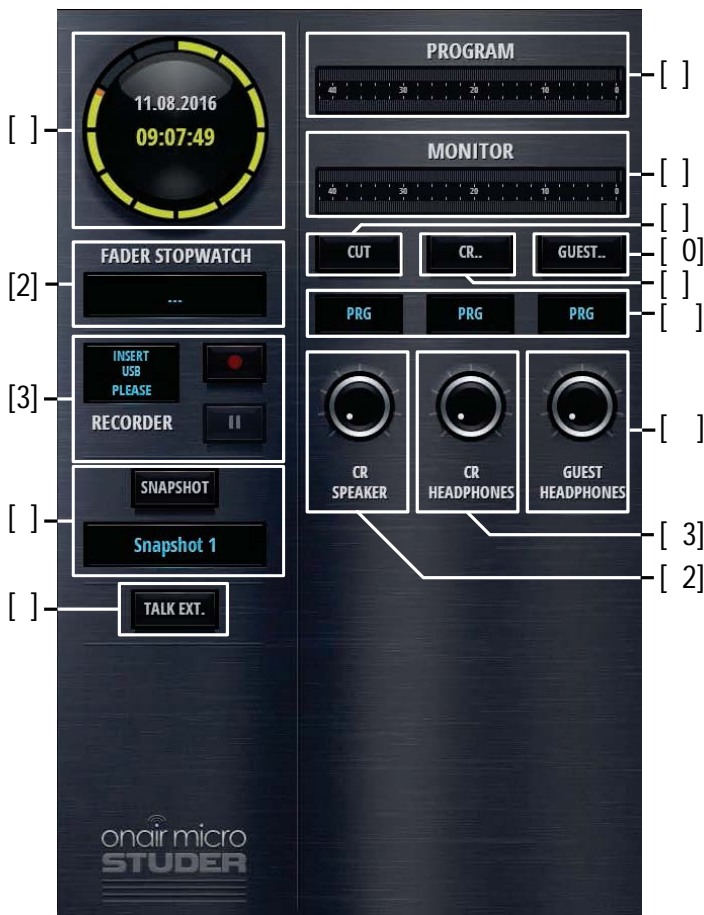
The central section of the main page hosts the following control elements :



- [1] **On Air Red Light Indicator** The On Air indicator is active when any of the input channels is on-air.
- [2] **Settings** A click or touch on this button leads to the Settings page where the basic configuration of the Micro Series is made.
- [3] **View buttons** The five view buttons allow to select the control elements that will be shown on the left section of the GUI.
- [4] **Scroll buttons** The scroll left and the scroll right button allow the operator to navigate to the desired faderstrips or meters.
- [5] **Reset PFL** This button releases any PFL button which is currently active anywhere in the mixer.

2.1.9 Right Section

The right section of the main page hosts control elements for Watch, Recording, Snapshot handling, Metering and Monitoring.



[1] **OnAir Watch** The OnAir watch gives a permanent display of the current time and date. It can be NTP synchronized.

[2] **Fader Stopwatch** The Fader stopwatch measures the channel-open time of the most recently opened channel that is “On-Master”. Only channels of the role “DJ”, “Guest” and “Input for Send” start the stopwatch. When clicking or touching onto the display of the stopwatch, a countdown time for the most recently opened channel can be entered. As soon as the time reaches 00:00:00, the channel name will flash for five seconds. If the time 00:00:00 is entered as a countdown time, the stopwatch will count upwards for as long as the channel is opened. The display of the stopwatch also indicates the name of the currently measured channel. When in countdown mode, the countdown icon in the top right corner of the display is shown.

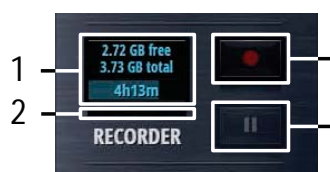
[3] **Recorder** As a default, the REC bus is feeding the USB Recorder. So all channels that are assigned to the REC bus are recorded as soon as a valid memory stick is inserted and the record button is pressed. Details see [chapter 2.1.9.1](#).

[4] **User Snapshots** The User Snapshot considers the fact that the Micro Series are designed as

a portable products to be used in different environments. Therefore the User Snapshot contains all required settings of a broadcast session. User Snapshots can be created, saved, loaded, renamed and deleted by the user at any time. Details see [chapter 2.1.9.2](#).

- [5] **Talk Ext.** This button activates the external talkback. TB source and destination can be configured. Details see [chapter 2.1.9.3](#).
- [6] **Program meter** The Program meter is displaying the audio level of the Program bus. The headroom level and balistics can be configured. Details see [chapter 2.4 - Meter tab](#).
- [7] **CR Monitor meter** The Monitor meter is displaying the audio level of the source which is currently chosen by the CR monitor. The headroom level and balistics can be configured. Details see [chapter 2.4 - Meter tab](#).
- [8] **Monitor Cut** This button lets the operator manually cut the CR monitor. In addition, CR cut is applied automatically when a channel of the role “DJ” or “Guest” gets on-air.
- [9] **CR Monitoring Options** This button opens the dialog to set the CR Monitoring Options. Details see [chapter 2.2.5](#).
- [10] **Guest Monitoring Options** This button opens the dialog to set the Guest Monitoring Options. Details see [chapter 2.2.6](#).
- [11] **Source displays** These three displays show the sources of the three different monitoring facilities.
- [12] **CR Speaker level** Lets the operator set the level of the CR monitor speakers
- [13] **CR Headphone level** Lets the operator set the level of the CR headphones
- [14] **Guest Headphone level** Lets the operator set the level of the Guest headphones

2.1.9.1 USB Recorder



At the moment an USB media is inserted into the Play/Rec USB port, a performance test of the media is carried out. When the media’s performance is sufficient, the LED next to the Play/Rec USB port turns green.

- [1] **Status Indication** With a valid USB media inserted, this display shows the amount of free memory of the inserted USB media. Below the free memory, the total amount of the inserted media’s memory is shown in [GB]. Then, there is a progress bar indicating the used memory of the USB storage media. Within the progress bar, the predicted remaining recording time is displayed in the format hh:mm:ss.
- [2] **Recording buffer** This thin bar shows the current usage of the recording buffer.

- [3] Record Button** Starts the recording. When the recording is on pause, another click/touch onto the Record Button restarts the recording and appends the recorded audio to the current file.
While recording, the Status Indication display shows the name of the currently recorded file and the files current length.
- [4] Pause/Stop Button** A click/touch on this button pauses the recording. A second click/touch onto this button stops the recording and the recorded audio is written to a file.
- Where are the files stored ?** By default, the recorded files are saved to the USB media into a folder automatically created, named 'Recordings'.
The files are also named automatically by the system. Time and date at the start of the recording determine the file name : yyyyymmdd-hhmmss.wav.
- Record Source Selection** The default source of the USB recorder is the REC bus. If desired, any other bus can be assigned as the recording source. This can be set on the Bus options page.
- Off-Air Record Function** Off Air Record is a convenient function for the operator to record a guest or telephone interview in parallel to the program, where e.g. the radio automation or a playlist from the track player is playing.

The Off Air Record function handles all required bus assignments changes of the recording channels automatically in the background and the operator doesn't have to care about.
- Scenario guest interview :** The operator wants to record a guest interview where he needs the DJ mic and a guest mic. Activating the Off Air Record function (REC) of the DJ- and guest mic automatically
- removes the DJ mic from PRG-, send busses
 - removes the guest mic from PRG-, send busses
 - assigns the DJ mic to the REC bus
 - assigns the guest mic to the REC bus
 - removes all other channels from the REC bus
 - selects REC as CR- and guest monitoring source
- as long as Off Air Record is active.
When terminating Off Air Record, the original monitoring sources and bus assignments as defined in the channel- or bus options pages are restored.

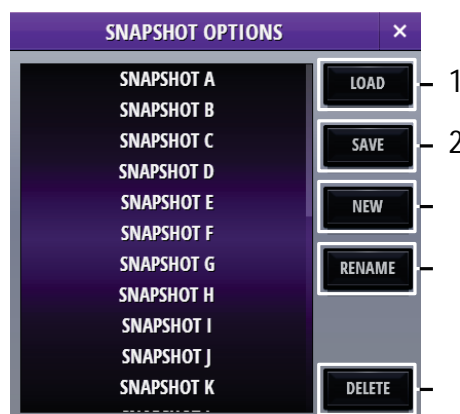
2.1.9.2 User Snapshots

A User Snapshot contains all parameters of the system, except from the parameters of the Settings section.



By Clicking/touching the **Snapshot** button, the snapshot options window opens and allows to load or save snapshots.

With the buttons on the right side, snapshots can also be renamed or deleted.



[1] **Load** Recalls the selected User Snapshot and applies all parameters to the Micro Core where channels that are currently OnAir are not affected. The button is greyed out if no User Snapshot is selected.

[2] **Save** Overwrites the currently selected User Snapshot. The button is greyed out if no User Snapshot is selected.

[3] **New** Creates a new User Snapshot capturing all parameters. A dialog opens asking the user for a name for the new User Snapshot. If this name is already used, the user has to confirm overwriting this snapshot in a further dialog

[4] **Rename** Renames the selected User Snapshot. The button is greyed out if no User Snapshot is selected. A dialog opens asking the user for a new name.

[5] **Delete** Deletes the selected User Snapshot.

Pending Channels A channel that is On-Master cannot be overwritten by a User Snapshot. Such a channel that should be updated from the snapshot, but is currently OnAir or On-Master is called a pending channel.

Only after this channel's fader is closed, or after deassigning it from the master bus, the channel's parameters are overwritten by the User Snapshot.

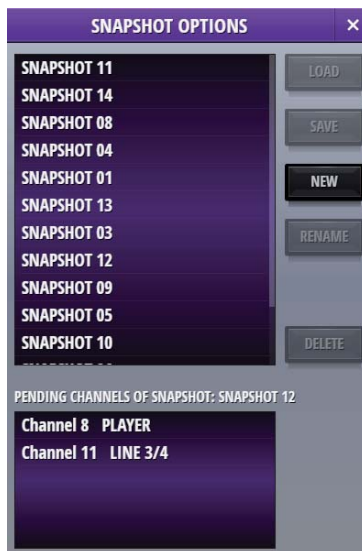
As soon as such a pending channel is no longer on a master bus, channel parameters of the most recently loaded User Snapshot are applied to that channel. This covers the case where subsequent User Snapshots are loaded while channels are still pending and makes sure that the most recently loaded User Snapshot is consistent.

Pending channels are indicated to the user in different ways:

- In the channel label display, the blue background colour flashes on all pend-

ing channels.

- On the Micro Fader module, the blue backlight is flashing on all pending channels
- The name of the most recent loaded snapshot is flashing as well.
- The Snapshot Options dialog lists pending channels and the name of the most recently loaded snapshot.



Note : After Pending Channels are not On-Master anymore, the User Snapshot parameters are also applied to this channel - except for three parameters that will NOT be applied. These parameters are :

- Fader value
- Channel ON/OFF
- OffAir Rec function

2.1.9.3 TB External

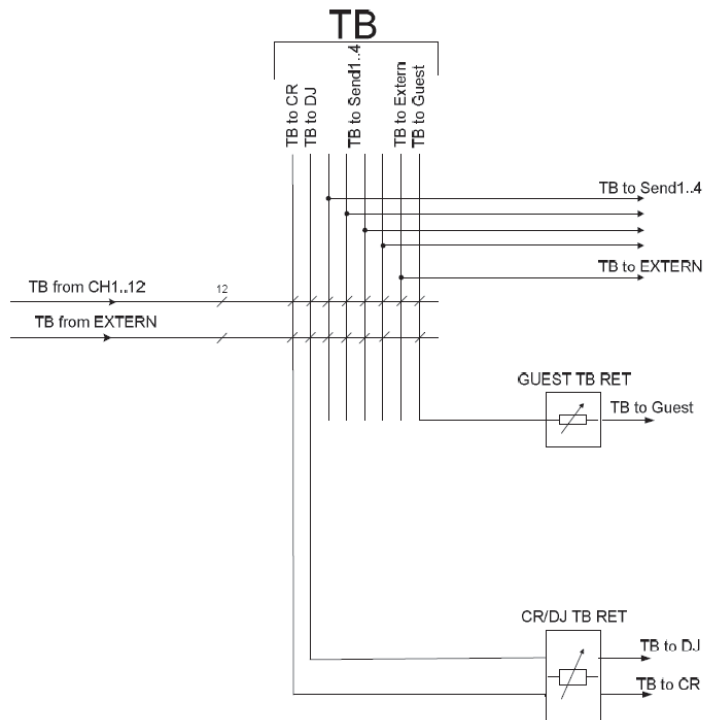


There is one TB target, called TB to Extern. This target can be assigned to any of the physical output ports. This can be done in one of the Bus Config pages. See chapter 2.3.2.

Please note that more than one output port can be the target for TB to Extern.

On the other hand - there is exactly one External TB Input. This External TB source can be configured in the CR Config page, under the tab Source, TB from Extern. See chapter 2.3.3.

As an overview, here the TB blockdiagram is shown :

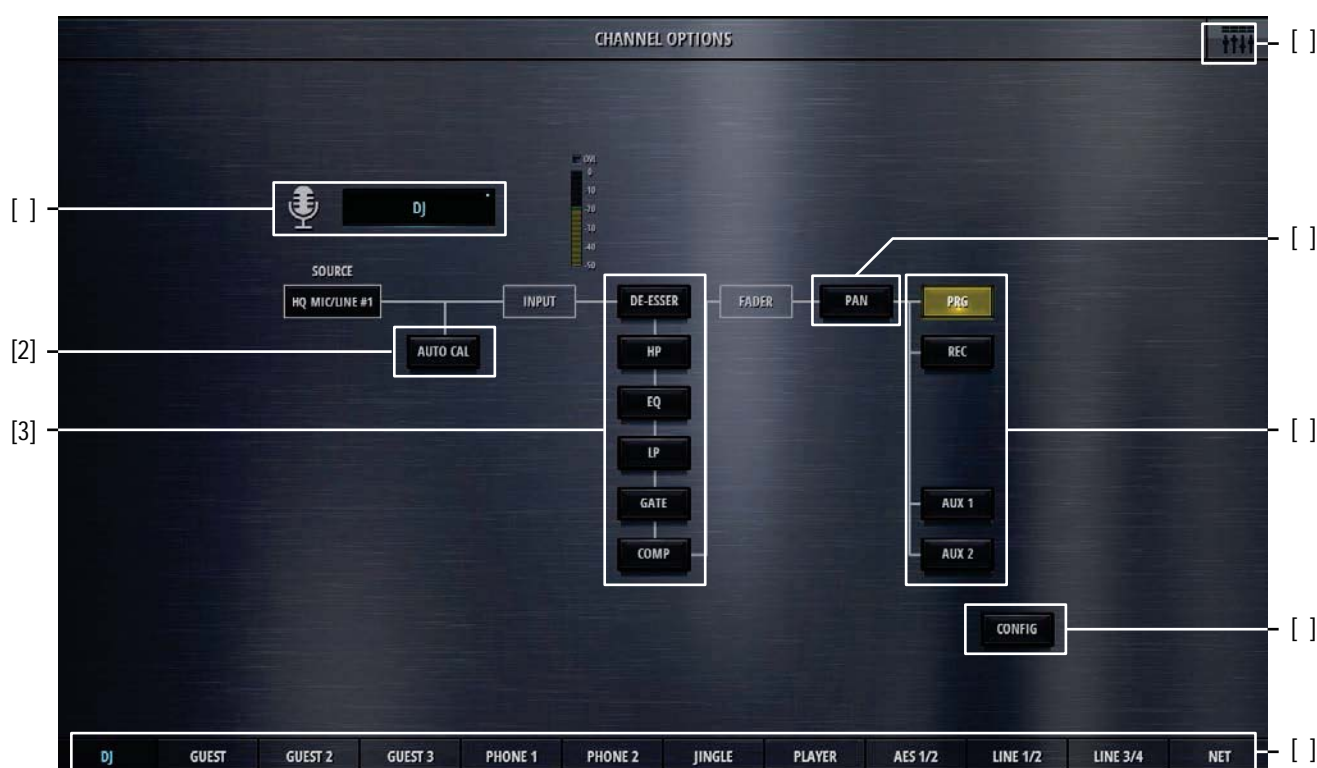


2.2 L2 - The options level

2.2.1 Channel options



Channel options are entered by doubleclicking or touching the channel label



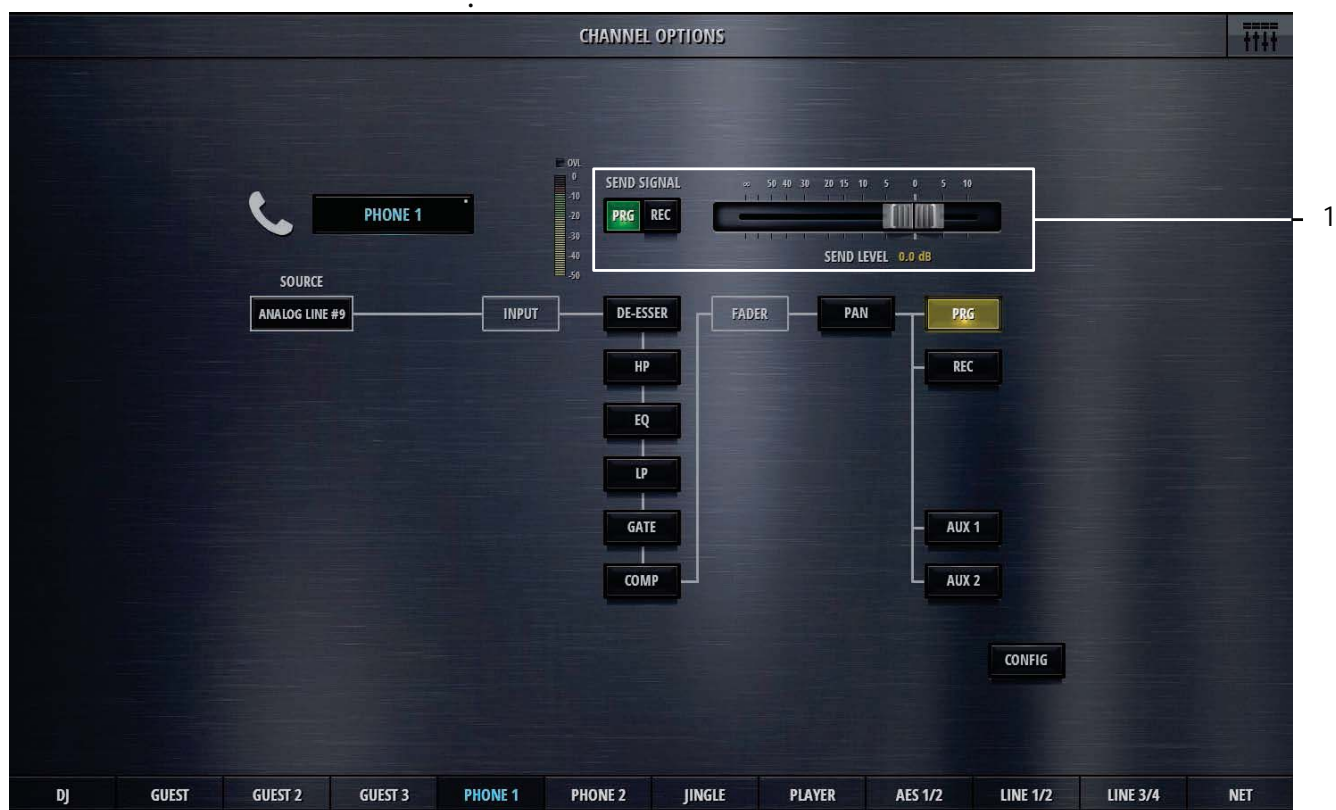
[1] Icon and Name Double-clicking on the name field allows the operator to enter a new channel name. The icon is automatically chosen, depending on the channel role.

[2] Auto Cal Touching the **AUTO CAL** button starts the Automatic Gain Calibration process. During the process the **AUTO CAL** button is flashing and the user is able to see the calibration process on the channel meter. The calibration process can be interrupted manually by touching the **AUTO CAL** button again. During the calibration process, the input signal is analyzed and the analogue input gain is adjusted automatically to reach the optimal mic/line input level. The calibration is depending on the headroom setting in the meter configuration section.
The Automatic Gain Calibration function is provided for all HQ Mic/Line channels.

[3] Channel processing On/Off The channel processing On/Off buttons (DeEsser, HP, EQ, LP, Comp, Gate) activate and deactivate the chosen processing block.

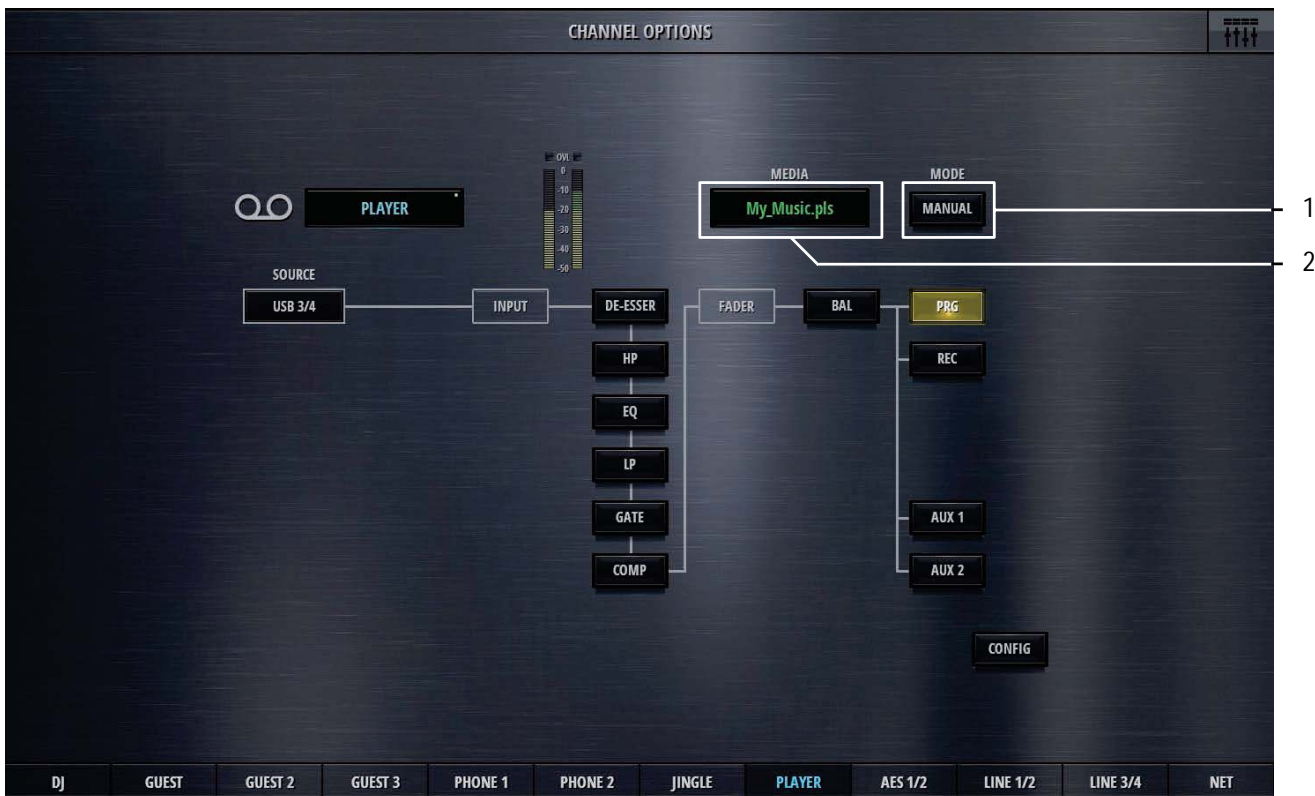
- [4] **Pan On/Off** The Pan On/Off button activates and deactivates the panning section.
- [5] **Bus assign buttons** These buttons assign the input channel to the desired busses.
- [6] **Config button** Pressing this button opens the configuration page of the current channel. There, the detailed channel configuration can be carried out, such as EQ parameter setting, Dynamics parameter setting, etc..Details see [chapter 2.3](#).
- [7] **Back to operation view** Clicking or touching onto the area in the top right corner navigates back to the operation view.
- [8] **Navigation** Navigation to the option pages of other channels is provided on the bottom channel navigation bar.

On channels of the role “Input for send”, there is an additional control element :



- [1] **Send signal and Send level** For “Input for send”- channels, on the channel options page also the bus for the send signal, as well as its level can be chosen. “Input for send” - channels are in other terms the N-1 bus owner channel. The send signal can then be called the N-1 mix or the mix-minus signal. The send level can also be set on the channel send view.

On channels of the role “Player”, there are two additional control elements :



[1] **Player Mode** Automatic or Manual. This settings is the same as the mode setting in the player view.

[2] **Media** Media and playlist selection

Clicking or touching onto the Media field, opens up the media dialog. This list shows :

- all known playlists, wherever they are on the USB stick
 - all known audio files in the ‘Media’ folder
 - all known audio files in the ‘Recordings’ folder
- A playlist or an audio file can be selected.

The following externally created playlists are supported :

File Extension	Description
.wpl	Windows Media Player Playlist
.m3u	Multimedia Playlist
.pla	Winamp Playlist
.pls	Text Based Multimedia Playlist

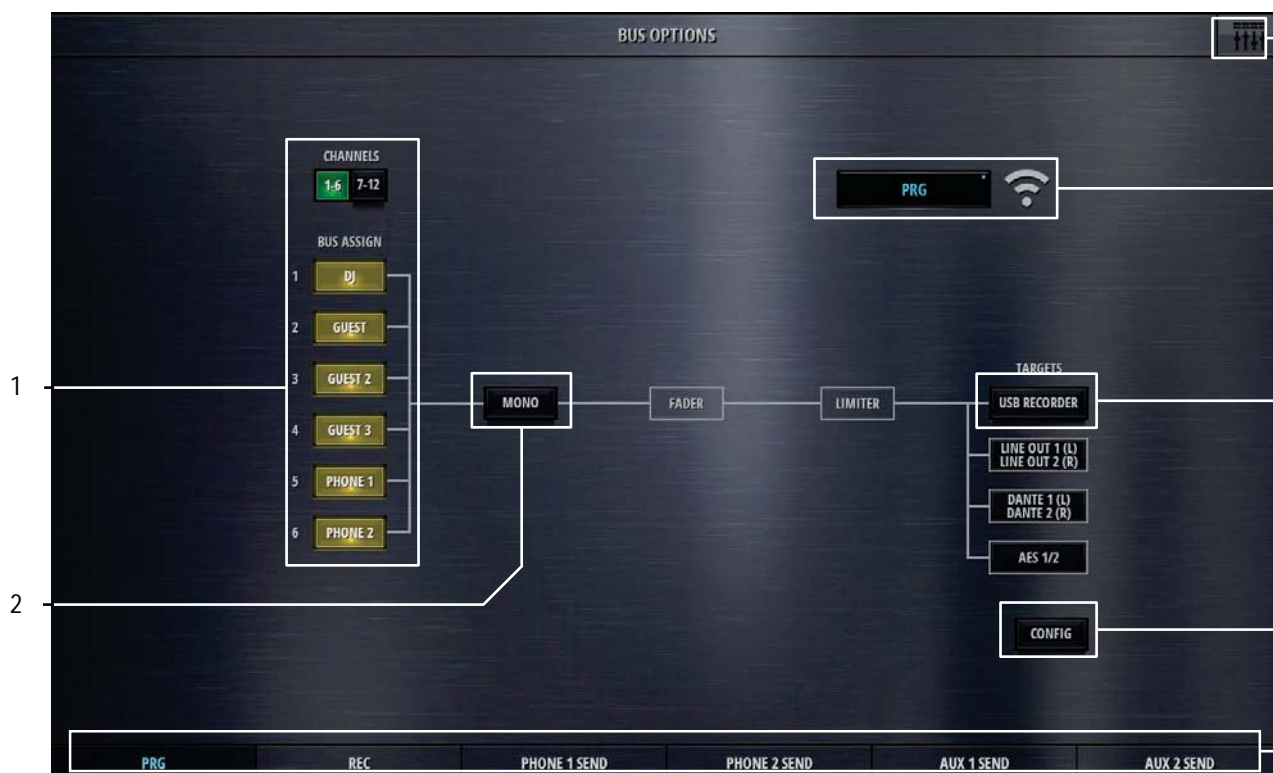
And the following audio file formats are supported :

Format	File Extension	Description
Wave	.wav	uncompressed audio
AAC	.aac	lossy audio compression
MP3	.mp3	lossy audio compression
Ogg Vorbis	.ogg	lossy audio compression
AIFF	.aif	uncompressed audio
FLAC	.flac	lossless audio compression

2.2.2 Bus options



Bus options are entered by doubleclicking or touching the send or bus label when in send or bus view



[1] **Bus assign** Bus assign (for Sum and Aux busses) allows to assign all of the input channels to the currently viewed bus.

[2] **Mono** The **Mono** button mixes down the stereo signal to a mono signal and assigns this signal to both, the Left and the Right leg of the stereo bus.

[3] **Icon and Name** Double-clicking on the name field allows the operator to enter a new bus name. The icon is automatically chosen, depending on the bus type and bus mode (Aux / N-1).

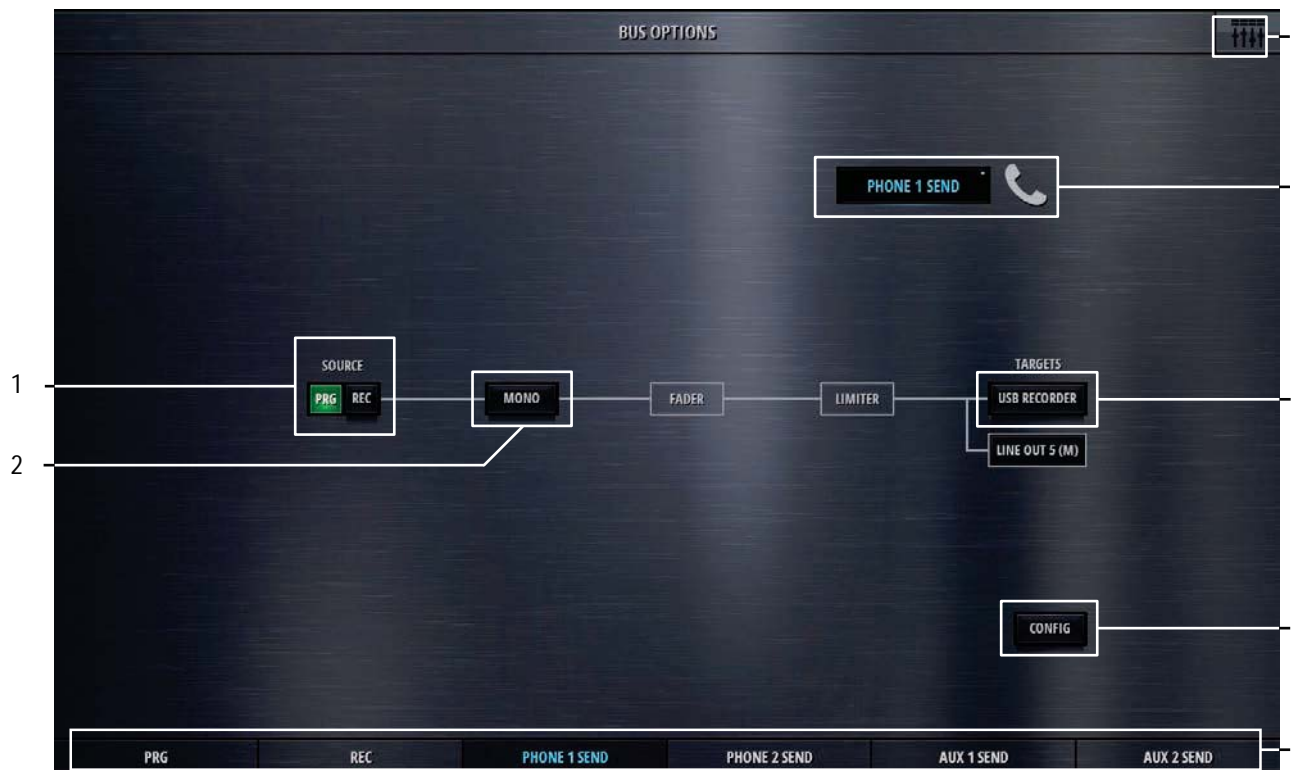
[4] **USB Recorder** Per default, the USB recorder is patched to the REC bus. If there is the need, the USB recorder can be patched to any of the busses (Sum, N-1, Aux). There is only one USB recorder available, which implies that it can only be patched to one of the busses at the time.

[5] **Config** Config button. Pressing this button opens the configuration page of the current bus. There, patching to outputs as well as choosing the bus mode and setting the send levels can be done. Details see [chapter 2.3](#).

[7] **Back to operation view** Clicking or touching onto the area in the top right corner navigates back to the operation view.

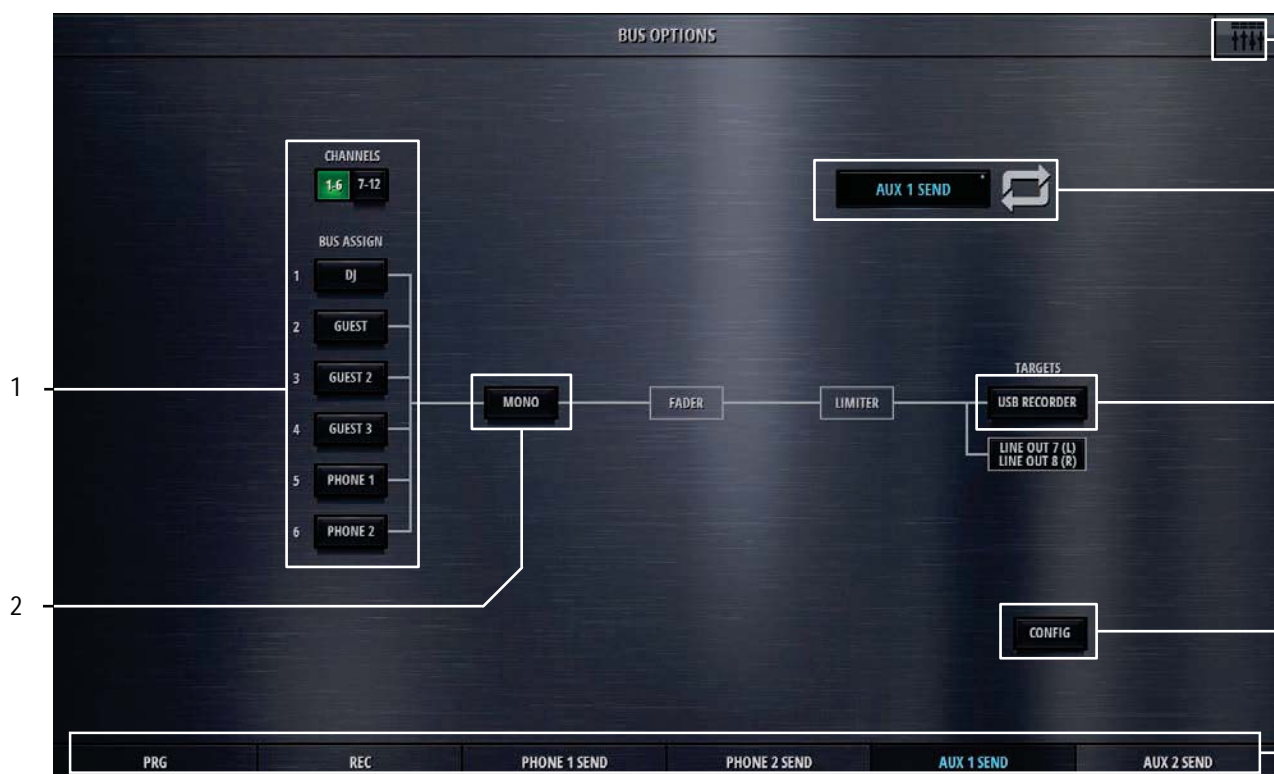
[8] **Navigation** Navigation to the option pages of other busses is provided on the bottom channel navigation bar.

The options page of the N-1 busses differs only in the source selection:



[1] **Source** Send signal **Prg** or **Rec** (for N-1 busses)

The options page of the Aux busses has the same bus assign buttons as the Sum busses.



2.2.3 Meter options

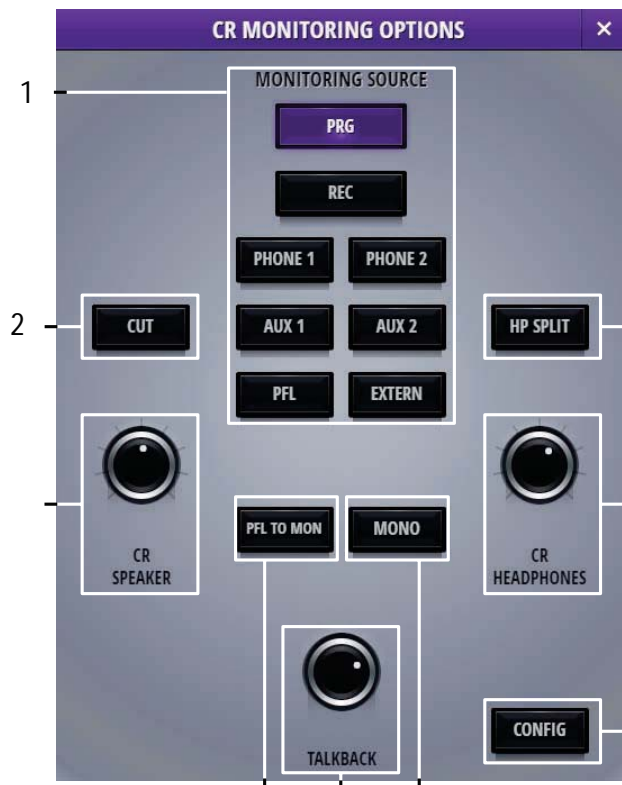
Doubleclicking the label in the meter view also opens the channel options

2.2.4 Snapshot options

See [chapter 2.1.9.2](#).

2.2.5 CR Monitoring options

By clicking/touching the **CR Monitoring Options** button, the CR monitoring panel is shown :



- [1] **CR monitoring source selector** With these buttons the source for the control room monitoring is chosen. The source is the same for the CR speakers and the CR headphones. The selected source is displayed on the source displays
- [2] **Monitor Cut** This button lets the operator manually cut the CR monitor.
- [3] **PFL to Mon** With this option active, the current CR monitoring source gets replaced with the PFL signal, as long as any PFL is active.
- [4] **Mono** This button mixes the stereo CR source down to a mono signal for both, CR speakers and CR headphones.
- [5] **Headphones Split Mode** With this mode active, the PFL signal will be fed to the left channel of the headphone, if PFL is active on any channel. On the right channel, still the previously selected CR source will be heard. Both signals are then downmixed to mono.
Once PFL is released, the current CR source will be heard in stereo again. If PFL is already selected as the CR source, actually pressing PFL on any channel will not change the stereo PFL bus as the monitoring source.
- [6] **TB return level** This rotary controls the incoming TB signal level which is fed to the CR speakers as well as to the CR headphones. Please note that the current CR source signal is then dimmed by 20dB.

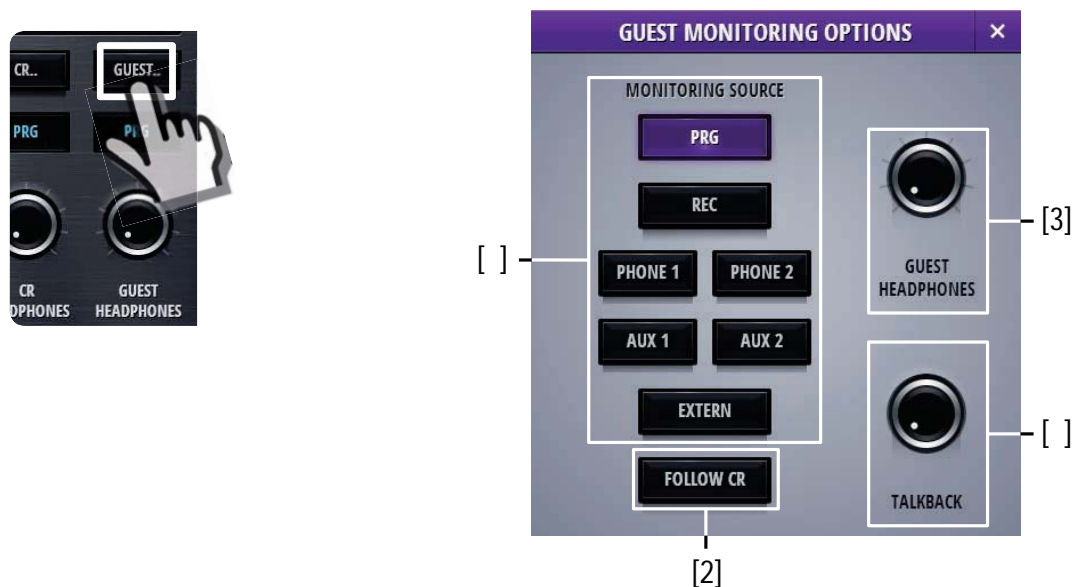
[7] CR speaker level This rotary controls the level of the CR speakers.

[8] CR headphones level This rotary controls the level of the CR headphones.

[9] **Config button** This button navigates to the CR monitoring config page.

2.2.6 Guest Monitoring options

By clicking/touching the **Guest Monitoring Options** button, the guest monitoring panel is shown :



[1] **Monitoring source selector** With these buttons the source for the guest monitoring is chosen. The selected source is displayed on the source display.

[2] **Follow CR** This button selects the same source as currently active on the CR monitoring section.

[3] Guest headphones level This rotary controls the level of the Guest headphones.

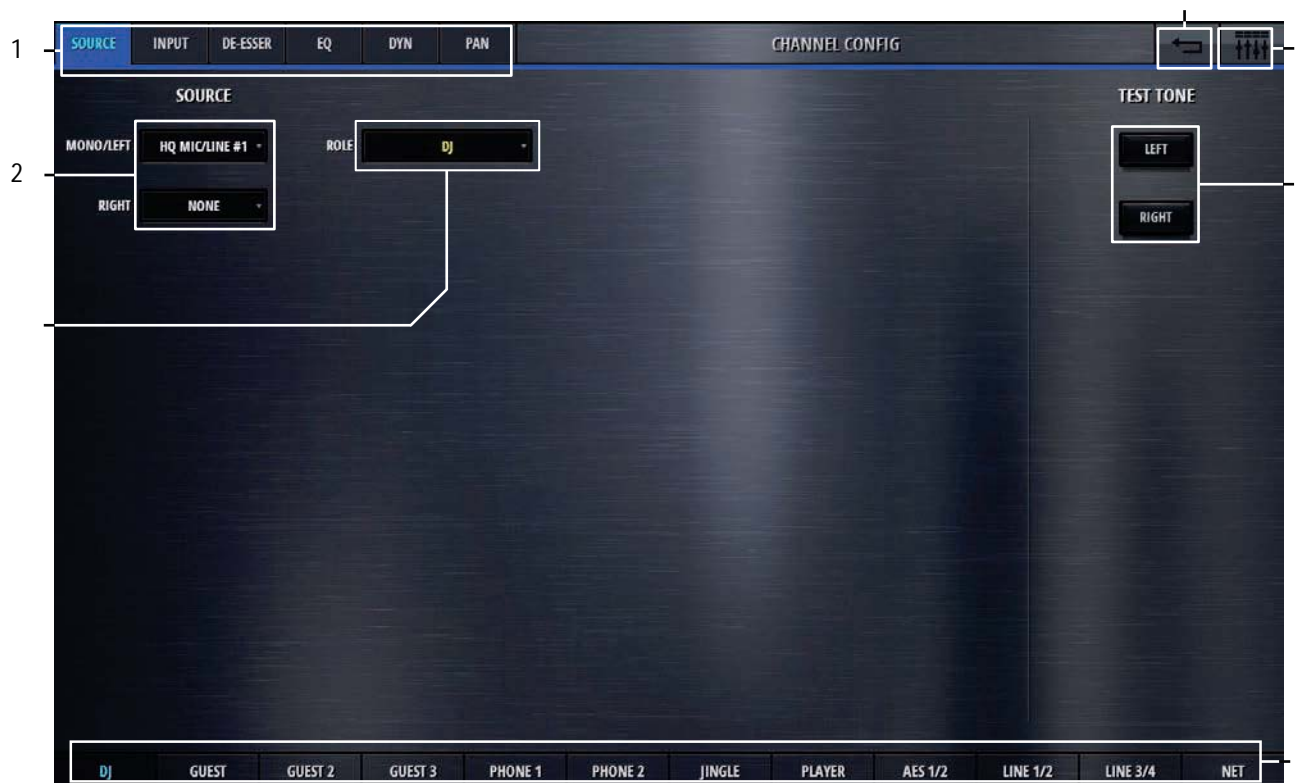
[4] TB return level This rotary controls the incoming TB signal level which is fed to the Guest headphones. Please note that the current Guest monitoring source signal is then dimmed by 20dB.

2.3 L3 - The configuration level

2.3.1 Channel config

Clicking/touching the **Config** button in the channel options view allows access to the channel config page. Six processing block selection tabs navigate to a channels different processing sections.

The config page of the channels source section holds control elements necessary to set the channels source selection.



[1] Processing tabs These tabs lets the operator navigate to the desired processing block of a channel.

[2] Source selection With these two pull-down menus, the source for the left channel leg, and the source for the right channel leg can be selected. If for the right channel leg the selection remains on “None”, then the channel is a mono channel. An exception are the sources “USB” and “AES” - these sources are always stereo sources and are only selected on the first pull-down menu.

[3] Channel role Here the role of the channel is defined. The choice is as follows :

- Default - for a simple input channel, no special behaviour
- DJ - for a mic source located in the control room (CR)
- Guest - for a mic source located in the control room (CR)
- Input for send 1 - the bus owner of a N-1 bus
- Input for send 2 - the bus owner of a N-1 bus
- Input for send 3 - the bus owner of a N-1 bus
- Input for send 4 - the bus owner of a N-1 bus

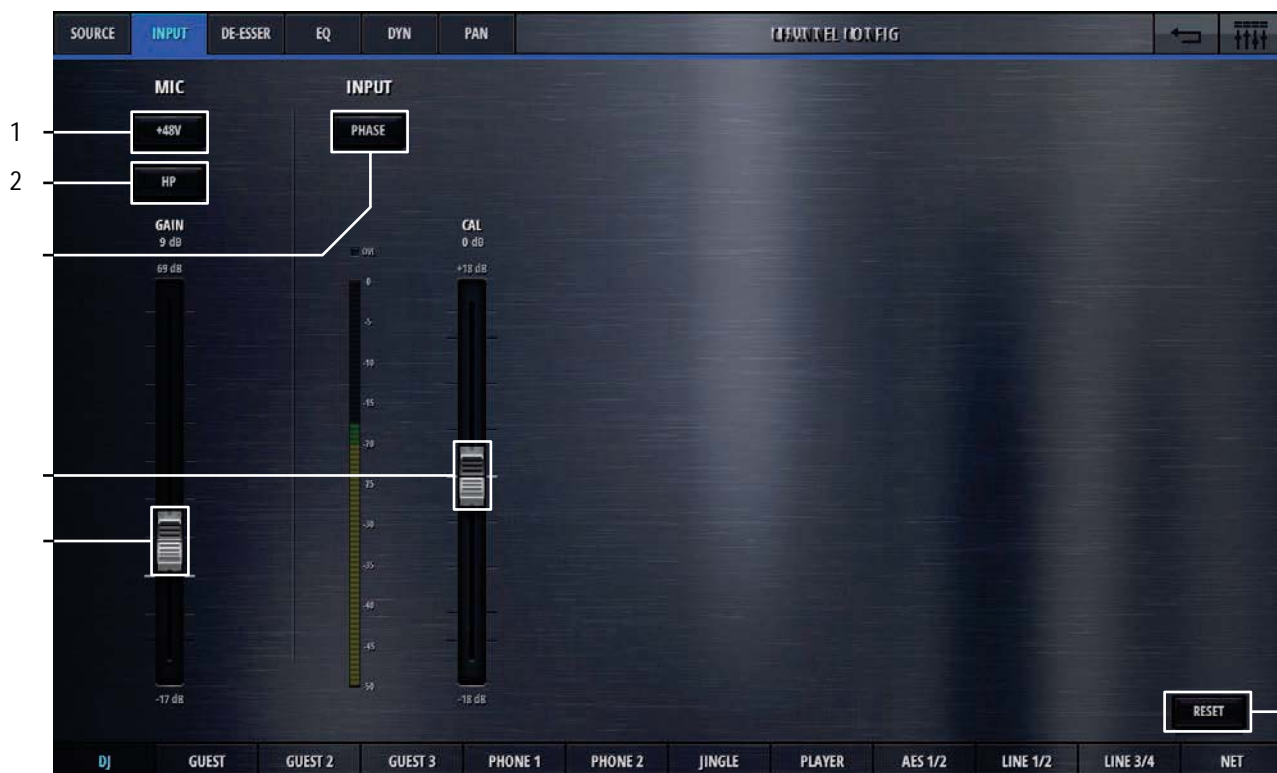
Jingle

Track

Depending on the channel role, the channels control elements on the GUI are different.

- [4] Test tone** With these two buttons, test tone can be fed to the left and the right leg of the channel. The test tone signal is defined in the “Settings”-page
- [5] Navigation back.** Clicking or touching onto this area navigates back to the Options page of this channel.
- [6] Back to operation view** Clicking or touching onto the area in the top right corner navigates back to the operation view.
- [7] Navigation to other channels** Navigation to the config pages of other channels is provided on the bottom channel navigation bar.

The config page of the channels input section holds control elements necessary to set the channels input levels :



If the channels source selection is a Mic source, then these three elements are provided on the left side of the page.

[1] 48V Switches phantom power (48V) to the microphone on and off.

[2] Highpass filter Activates a highpass filter on the analog side of the microphone input, before the A/D converter. This can be useful to filter out rumbling noise on speech signals. The cutoff frequency of this filter is fixed at 75Hz and it has a slope of 12dB/oct.

[3] Mic gain This fader sets the microphone gain. The gain range is 86dB and the absolute numbers on the fader-scale are depending on the Max Level of the analog I/O. Max Level is defined in the Settings page.

On channels with Line inputs as source, other control elements are displayed in place of the Mic control elements.

Max Level



The Max Level setting defines the systems reference line level for 0dBFS. This is a global setting found on the Settings-page. But it can also be set on a channel by channel basis. This setting needs to correspond with the actual level calibration of the analogue input- and output interfaces. As a standard, the Micro Core is shipped with all analogue levels calibrated to +9dBu. This means that the highest possible analogue signal that leaves the mixer is +9dBu. And it also means, that signals which are higher than +9dBu will clip the A/D converters.

Then, in the second section of this page, the control elements of the digital

processing are found.

[4] **Phase** Inverts the mono signal or the left channel of the stereo signal if turned On.

[5] Input calibration This fader allows the operator to trim the signal by +/-18dB



On stereo channels, in this section also a **Mono** button can be found. This button downmixes the stereo signal to mono : $\text{Mono} = (\text{Left} + \text{Right}) - 3\text{dB}$

[6] **Reset** This button sets all values of this processing block to the default values. Please note that this button can be found on every tab of the channel config page.

The config page of the channels de-esser section holds control elements necessary to set the channels De-esser parameters :



- [1] **DeEsser On/Off** Activates the De-Esser when illuminated.
- [2] **RTA** A real time frequency analysis of the channels signal is computed and displayed in the spectrum field of the De-Esser. This is a visual aid helping the operator to find the problematic areas of the channels signal.
- [3] **Reverse** The reverse function allows listening to the part of the signal which is going to be removed by the De-Esser.
- [4] **Freq** Sets the operation frequency of the De-Esser.
- [5] **Q** Sets the width of the bandpass filter.
- [6] **Threshold** Sets the threshold of the bandpass compressor.
- [7] **Ratio** Sets the ratio of the bandpass compressor.
- [8] **Attenuation** Controls the amount of gain reduction. Attenuation is only available when **Auto** is active.
- [9] **Auto** Enables automatic threshold, which dynamically adjusts the De-Esser threshold according to the incoming audio. When **Auto** is active, Ratio and Threshold controls are disabled in place of Attenuation.
- [10] **Reset** This button sets all values of this processing block to the default values.
- [11] **Presets** Opens the preset window for the De-Esser presets.

The config page of the channels eq section holds control elements necessary to set the channels eq and high- and lowpassfilter :



[1] **EQ On/Off** Activates the EQ when illuminated.

[2] **Highpass filter On/Off** Activates and deactivates the highpass filter.

[3] **Lowpass filter On/Off** Activates and deactivates the lowpass filter.

[4] **RTA** A real time frequency analysis of the channels signal is computed and displayed in the spectrum field of the EQ. This is a visual aid helping the operator to find the problematic areas of the channels signal.

[5] **Freq** Controls the frequency parameter of the selected EQ band. One of the four EQ bands can easily be selected by clicking or touching onto the numbered (1-4), coloured circles on the frequency axis.

[6] **Q** Sets the width of the EQ band.

[7] **Gain** Sets the gain (+/- 18dB) of the EQ band.

[8] **Reset** This button sets all values of this processing block to the default values.

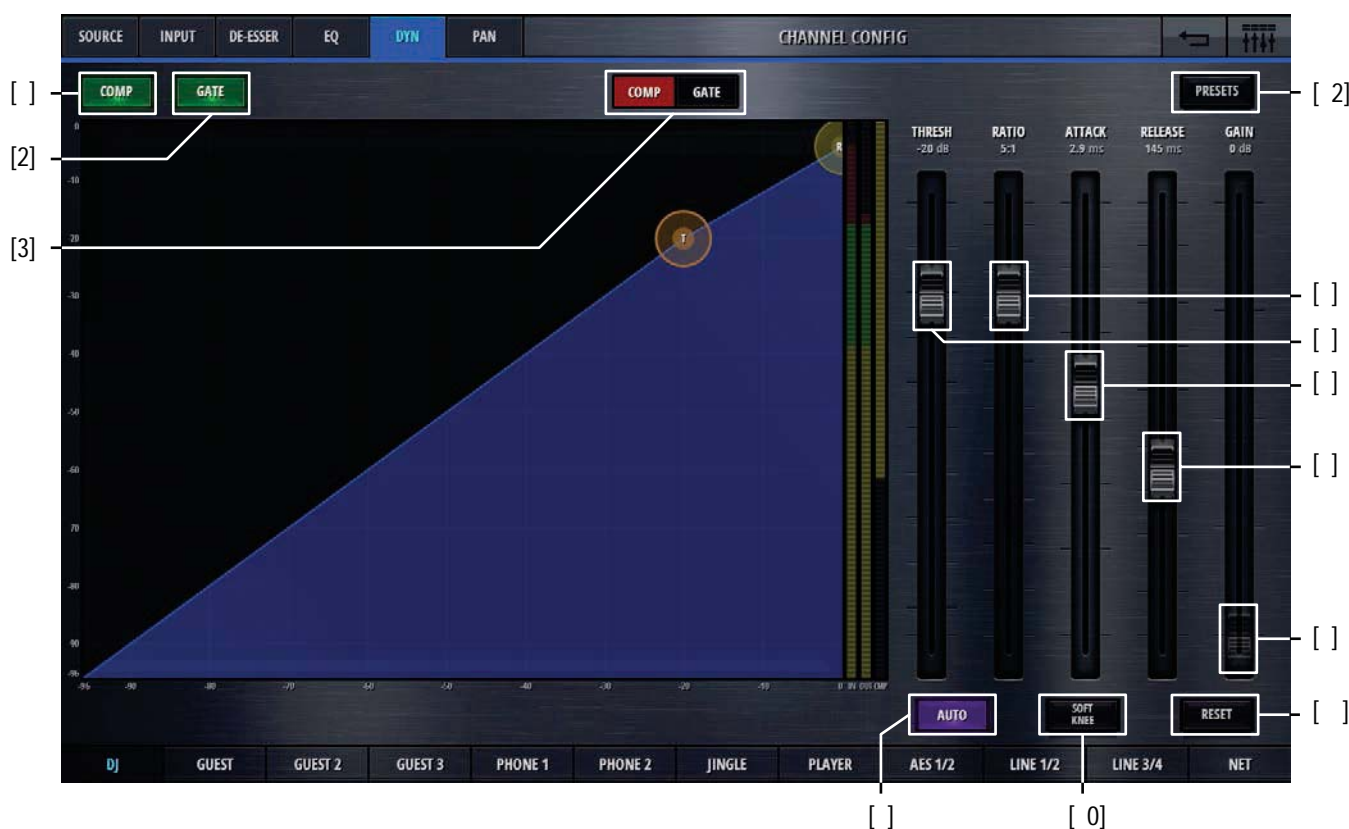
[9] **Presets** Opens the presets window for EQ presets.

The EQ can also completely be operated on the spectrum field - either by using mouse or touchscreen.



If either highpass- or lowpass circles are selected, the filter parameters are displayed instead of the EQ band parameters.

The config page of the channels dynamics section holds control elements necessary to set the channels compressor and gate parameters :



- [1] **Comp On/Off** Activates the compressor when illuminated.
- [2] **Gate On/Off** Activates the gate when illuminated.
- [3] **Comp/Gate** Selects either the Comp- or the Gate view.
- [4] **Threshold** Sets the threshold parameter of the compressor. The lower the threshold, the more signal compression is achieved.
- [5] **Ratio** Sets the compression ratio parameter. A ratio of 1:1 doesn't process the signal at all, a ratio of 3:1 is a medium compression, 5:1 a heavy compression and settings above 10:1 are called limiting.
- [6] **Attack time** Sets the attack time of the compressor. The shorter this attack time is, the quicker a gain reduction is applied to the signal.
- [7] **Release time** Sets the release time of the compressor. The longer this release time is, the longer it takes until the gain reduction is released and the signal becomes unprocessed again.
- [8] **Gain** Sets the makeup gain of the compressor. This is a simply signal amplification stage that allows to bring the processed signal back to the desired level.
- [9] **Auto** This button overrules the Gain parameter and automatically applies as much makeup gain as needed to make the processed output signal as loud as the

unprocessed input signal.

[10] Softknee Sets the Softknee mode On and Off. The activated Softknee mode softens the transition area around the threshold value.

[11] Reset This button sets all values of this processing block to the default values.

[12] Presets Opens the presets window for Compressor presets

Here, the gate view is shown :



[1] Comp On/Off Activates the compressor when illuminated.

[2] Gate On/Off Activates the gate when illuminated.

[3] Comp/Gate Selects either the Comp- or the Gate view.

[4] Threshold Sets the threshold parameter of the gate. With a low threshold, the noise gate will open up already for very small signals. With a higher threshold, only larger signals will trigger the noise gate to open up.

[5] Attack time Sets the attack time of the gate. The shorter this attack time is, the quicker the noise gate opens up.

[6] Release time Sets the release time of the gate. The longer this release time is, the longer it takes until the noise gate is closed again.

[7] Attenuation Sets the attenuation parameter of the gate. To make the noise gate completely

blocking a signal, the attenuation must be a large value. If the attenuation is left at 0dB, the noise gate has no influence at all.

- [8] **Reset** This button sets all values of this processing block to the default values.
- [9] **Presets** Opens the presets window for Gate presets

The config page of the channels pan section holds control elements necessary to set the channels panning/balance :



Pan/Bal depending wether mono or stereo channels

- [1] **Pan/Bal On/Off** Activates the panner when illuminated.
- [2] **Pan/Bal** Positions the signal between the left and the right leg of all stereo busses it is assigned to.
- [3] **Reset** This button sets all values of this processing block to the default values.

The config page of the channels send section holds control elements necessary to set the channels send levels :



[1] Send levels These are the send levels of all input channels. Since the input channels are fed “post-fader” to the send bus, these send levels can be regarded as a trim function. Please note that the channel that we are currently configuring cannot be sent to its own send bus (N-1 concept, also called mix-minus) .

[2] Master Send level Sets the output level of the send bus.

[3] On/Off Switches the output signal of the send bus on and off.

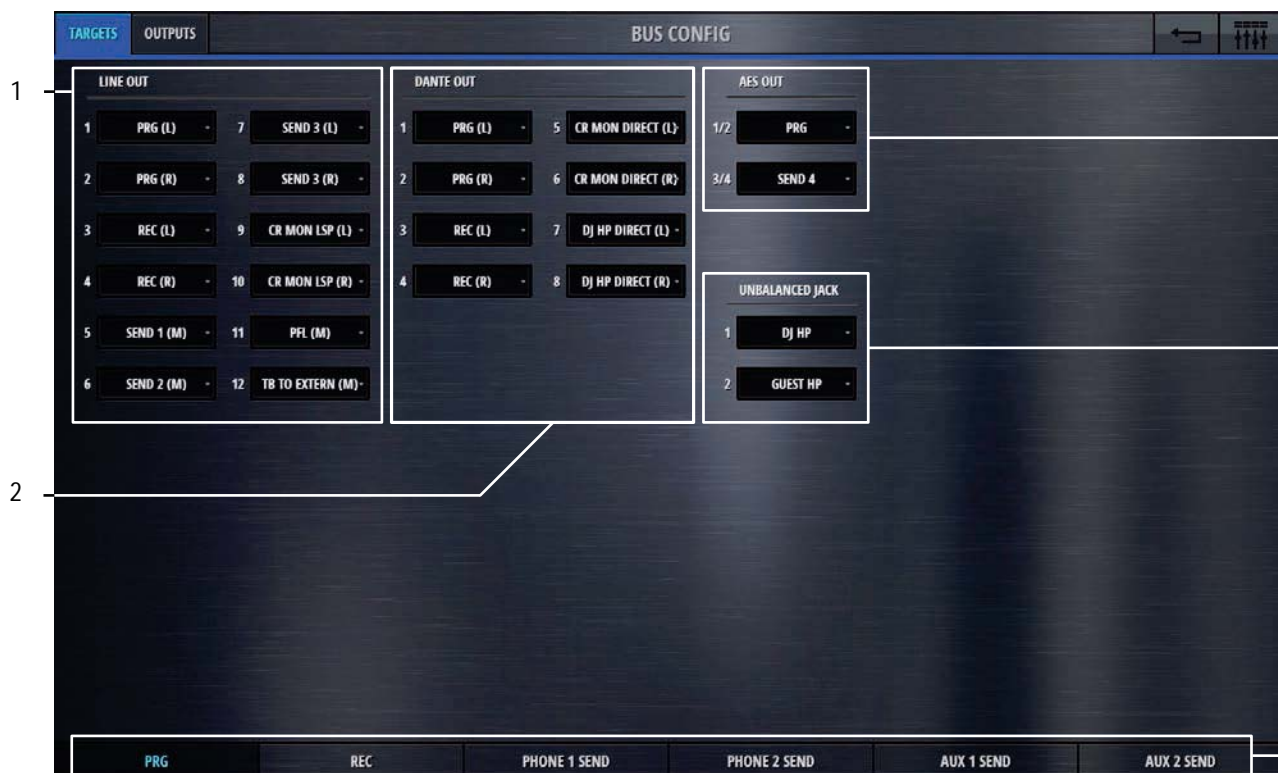
[4] Reset Resets all parameters.

2.3.2 Bus Config

Clicking/touching the **Config** button in the bus options view allows access to the bus config page.

Two or three selection tabs navigate to the different sections. PRG and REC busses have the tabs Targets and Outputs. All other busses have Send, Targets and Outputs tabs.

The config page of the busses Target section holds control elements necessary to assign mixer internal sources to the output ports.



[1] Line Out Here, the sources for the 12 Line Out output ports can be assigned. This is done by clicking/touching on the source. A choice of all possible sources appears in a list where simply the desired source can be selected. There are sources that are marked (L) or (R) or (M). As Line Out ports are mono, only mono sources can be selected, (L) stands for the left leg of a stereo source, (R) stands for the right leg of a stereo source, and (M) is the stereo source downmixed to mono.

[2] Dante Out Here, the sources for the eight Dante Out output ports can be assigned.

[3] AES Out Here, the sources for the two stereo AES Out output ports can be assigned.

[4] Unbalanced Jack Here, the sources for the two stereo headphone output ports can be assigned.

[5] Navigation to other busses Navigation to the config pages of other busses is provided on the bottom bus navigation bar.

Note : Please note, that this view is the same for all six busses !
The output assignment can only be made once for each output port.

The config page of the busses Output section holds control elements necessary to calibrate the levels of the analog output ports.



[1] Line Out Here, the Max Level of the 12 Line Out output ports can be selected. This setting defines the analog signal level for the highest possible internal signal of 0dBFS. It can set for each Line Out individually.

Note : Please note, that this view is the same for all six busses !
On the Settings page under the tab Audio, this setting can be made globally for all analog input- and output ports at once.

The config page of the N-1 busses Send section holds control elements necessary to set the actual send levels of contributing channels - e.g. to set the mix.



[1] Send levels These are the send levels of all input channels to the currently chosen bus. Please note that the channel that we are currently configuring cannot be sent to its own send bus (N-1 concept, also called mix-minus) .

[2] Master Send level Sets the output level of the send bus.

[3] On/Off Switches the output signal of the send bus on and off.

[4] Bus Mode Lets the user select the bus mode that can either be N-1 or Aux.
N-1 : this mode is made for busses that are feeding a return signal to remote positions. This mode doesn't allow the input signal of the remote source to be assigned to the bus. With this bus mode, the remote source (e.g. a reporter) will never have his own signal in his return feed. This is optimal to prevent echo's that could be introduced through long distance signal transmission.

Aux : this is the bus mode that allows all sources to be assigned to the bus . The user can decide whether the signal should be sent to the bus either *before* or *after* the channels fader. This can be set for each source individually by choosing Pre or Post with the button on the top. Also each source has an individual on/off button to select the desired bus assign (see image below).

[5] Reset Resets all parameters.

The config page of the AUX busses Send section holds control elements necessary to set the actual send levels of contributing channels - e.g. to set the mix.



[1] **Pre/Post** Lets the user decide whether the signal should be sent to the Aux bus either *before* or *after* the channels fader. “Pre” stands for *before the fader*; “Post” stands for *after the fader*.

[2] **Send levels** These are the send levels of all input channels to the currently chosen bus.

[3] **Send On/Off** Each source has an individual On/Off button to assign the channel to the Aux bus.

[5] **Master Send level** Sets the output level of the send bus.

[4] **On/Off** Switches the output signal of the send bus on and off.

[6] **Bus Mode** Lets the user select the bus mode that can either be N-1 or Aux.
N-1 : this mode is made for busses that are feeding a return signal to remote positions. This mode doesn't allow the input signal of the remote source to be assigned to the bus. With this bus mode, the remote source (e.g. a reporter) will never have his own signal in his return feed. This is optimal to prevent echo's that could be introduced through long distance signal transmission.

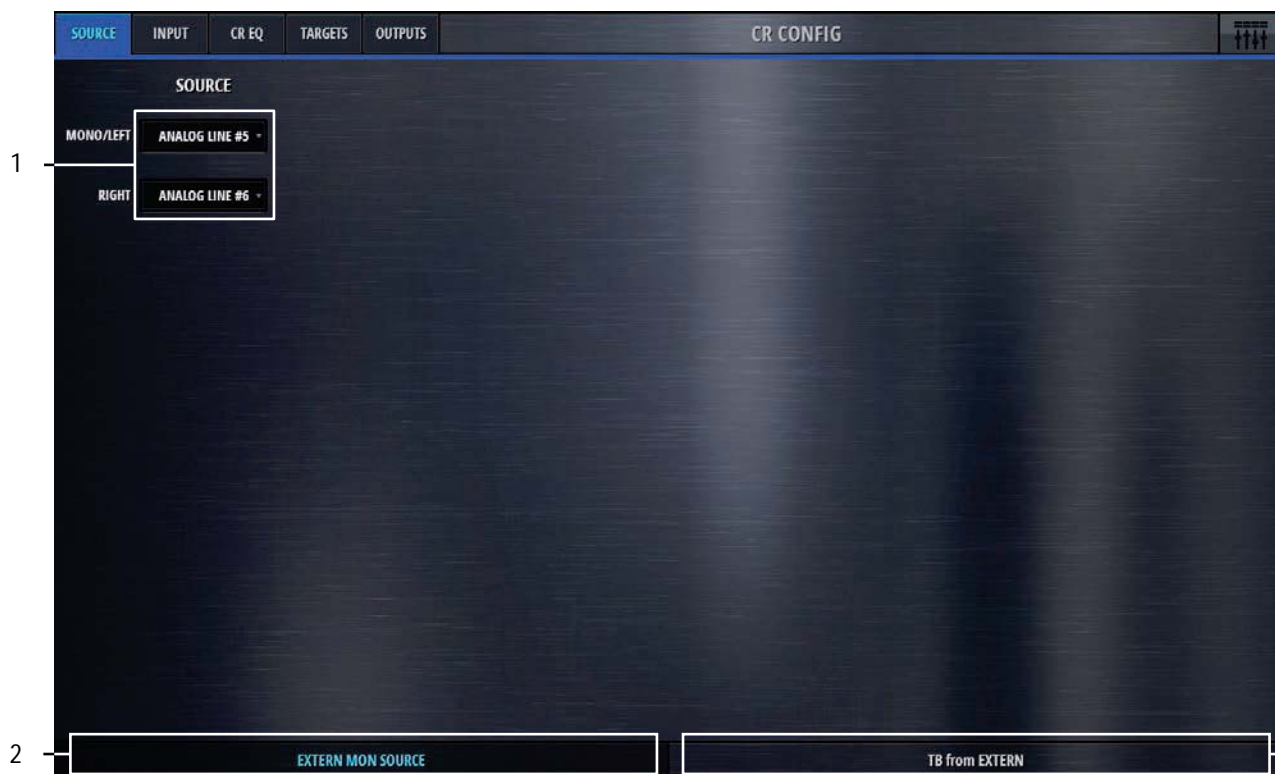
Aux : this is the bus mode that allows all sources to be assigned to the bus . The user can decide whether the signal should be sent to the bus either *before* or *after* the channels fader. This can be set for each source individually by choosing Pre or Post with the button on the top. Also each source has an individual on/off button to select the desired bus assign.

[7] **Reset** Resets all parameters.

2.3.3 CR Monitoring Config

Clicking/touching the **Config** button in the CR Monitoring options view allows access to the CR config page. Five selection tabs navigate to the different sections.

The config page of the Source section holds control elements necessary to select a source for two different purposes.



[1] Source Here, a mono or stereo source can be chosen for two different purposes :
 External Monitoring Source
 TB from Extern

Depending on the selected tab :

[2] External Monitoring Source The signal that is selected here becomes the external monitoring source. It will be active on the CR monitor when the corresponding button is pressed.



- [3] TB from Extern** Allows to define the input port, where the external TB returns into the Micro Core. This is the return signal of the external TB circuit. The send signal (TB to Extern) can be defined in the Target tab.

On the Input tab of the CR Config page, the input parameters of the two selected source-signals can be set.



[1] **Phase** If the selected source signal is a stereo signal, the Phase button is available. This button inverts the phase of the left channel.

[2] **Mono** Also for stereo sources - the Mono button mixes down the stereo signal to a mono signal.

[3] **Input Calibration** The Cal fader allows to calibrate the signal within a range of +/- 18dB.

[4] **Reset** This button sets all values of this processing block to the default values.

If the channels source selection is a Mic source, then three more elements are provided on the left side of the page. These are :

- 48V**
- Highpass Filter**
- Mic Gain

On channels with Line inputs as source, other control elements are displayed in place of the Mic control elements.

Max Level The Max Level setting defines the systems reference line level for 0dBFS. This is a global setting found on the Settings-page. But it can also be set on a channel by channel basis. This setting needs to correspond with the actual level calibration of the analogue input- and output interfaces. As a standard, the Micro Core is shipped with all analogue levels calibrated to +9dBu. This means that the highest possible analogue signal that leaves the mixer is +9dBu. And it also means, that signals which are higher than +9dBu will clip the A/D converters.



The CR EQ tab displays a graphic equalizer (GEQ) that is inserted into the CR MON LSP signal path. It can be used to flatten undesired room resonances of the control room.



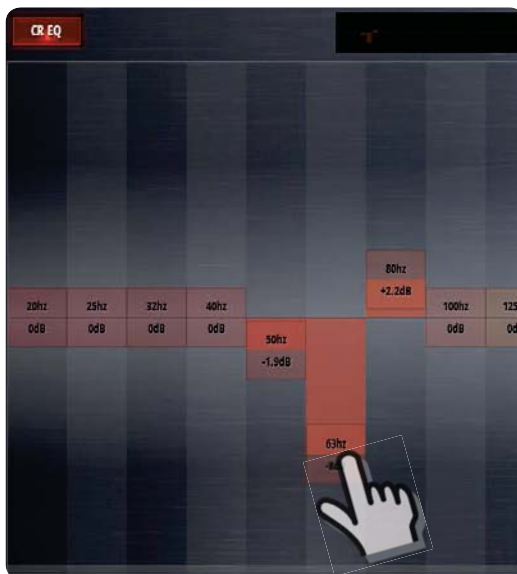
[1] **CR EQ** Activates the GEQ when illuminated.

[2] **Left side** This area displays an overview icon of the left side portion of the GEQ. Clicking/touching onto this area allows to operate the 32 bands of the GEQ in the large window below.

[3] **Link/Unlink** Clicking/touching onto this area unlinks the left- and the right side of the GEQ. As a default, the left and right side are linked, allowing to control either side of the GEQ while the parameters of the other side automatically are set to the same values.
Please note that when linking both sides, always the current setting of the left side GEQ is taken and applied to both sides.

[4] **Right side** This area displays an overview icon of the right side portion of the GEQ. Clicking/touching onto this area allows to operate the 32 bands of the GEQ in the large window below.

[5] **GEQ bands** These are the actual GEQ bands that can be used to set the desired band values in a range of +/- 15dB. Clicking/touching and dragging at the same time slides the bands up or down.



[6] **RTA** A real time frequency analysis of a selectable signal is computed and displayed in the spectrum field of the GEQ. This is a visual aid helping the operator to find the problematic areas of a specific source.

[7] **RTA Source** This is the source selector for the signal that is fed into the RTA.

[8] **Presets** Opens the presets window for GEQ presets.

[9] **Reset** This button flattens and deactivates the GEQ.

The Targets- and Outputs tabs are the same pages as also shown in the bus config pages.

2.4 Settings view



A click or touch onto the **Settings** button leads to the Settings page where the basic configuration of the Micro Core is made.

On the Network tab, the network configuration can be made and the current status of the network is displayed.

On the Network tab, the network states are shown and the network can be configured.



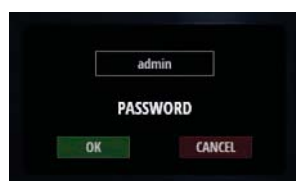
[1] Hotspot status display Here the current status of the internal Hotspot is shown. The base unit of the OnAir Micro is able to produce its own WLAN, or with other words, it has its own Wireless Access Point (WAP). When the Hotspot is enabled, the Wi-Fi is automatically disabled and vice versa.

[2] Wi-Fi status display This section shows the current state of the Wi-Fi section. When the Wi-Fi is enabled, the Hotspot is automatically disabled and vice versa.

[3] Ethernet status display Here the current settings of the wired Ethernet port are shown. The Ethernet port can be used while Hotspot/Wi-Fi access is also active.

[4] Config button By pressing this button, the network configuration pages are opened.

The Config logon window appears, and the following password need to be entered :



Password : admin

Hotspot Configuration Page

STUDER OnAir Micro Network Config

Hotspot Configuration | Wi-Fi Configuration | LAN Configuration | Administrator Password

Please power cycle the micro core after changing the parameters on this page.

Hotspot

Enable the micro core's internal Hotspot (AP)
Enabling this automatically disables joining external WiFi networks (Wi-Fi Configuration)

Enabled Disabled Reset Default

SSID
Studer Micro Core

SSID Broadcast
Enabled Disabled

Wireless Regulatory Domain
United States

Channel
Channel 9, 2.452 GHz

Security
None WPA2

WPA2 Password (factory default is: microcore)

Cancel/Exit Save/Update

Hotspot Enable/Disable This page allows to enable or disable the internal Hotspot.

Wireless Frequency The hotspot can use two different frequency ranges : 2.4GHz or 5GHz

SSID Service Set Identifier . This is the name of the WLAN, as it appears on any device receiving this WLAN if SSID Broadcast is enabled..

SSID Broadcast When enabled, the name of the WLAN (SSID) will be visible for all devices that can receive it. If disabled, the WLAN name will be hidden - while the WLAN is still usable for the ones that know the name.

Wireless Regulatory Domain Countries apply their own regulations to the allowable channels. This pull-down selects the country where you are using the Micro Core.

Channel Here, the WLAN channel can be chosen. A number of channels are available within the Wi-Fi spectrum, depending on the Regulatory Domain - 13 for Europe (ETSI), and 11 for North America (FCC), for example. Third-party software is available to help select Wi-Fi channels.

Security Allows to make use of a password protection for the WLAN.

Wi-Fi Configuration Page

- Enable/Disable** This page allows to enable or disable the Wi-Fi network. When the Wi-Fi is enabled, the Hotspot is automatically disabled and vice versa.
- Wireless Frequency** The Wi-Fi network can use two different frequency ranges : 2.4GHz or 5GHz
- SSID** The name of the WLAN that you would like to use must be entered here.
- Pasword** The password for the above entered WLAN
- Address** Lets you chose wether the IP address is automatically received from the network (DHCP), or wether it is a manually entered, fixed address.
- IP** If a manuall IP address is chosen, it must be entered here.
- Netmask** This is the submask of the manually enetered IP address (normally 255.255.255.0)
- Gateway** Here a gateway address can be entered if needed.

LAN Configuration Page

STUDER OnAir Micro Network Config

Hotspot Configuration Wi-Fi Configuration **LAN Configuration** Administrator Password

Please power cycle the micro core after changing the parameters on this page.

LAN
Enable the micro core's ethernet port

Enabled Disabled Reset Default

Address
DHCP Manual

IP
10.10.2.1

Netmask
255.255.255.0

Gateway
10.10.2.1

Cancel/Exit Save/Update

Enable/Disable This page allows to enable or disable the LAN network. The LAN section can be active in addition to the Hotspot/Wi-Fi section.

Address Lets you chose wether the IP address is automatically received from the network (DHCP), or wether it is a manually entered, fixed address.

IP If a manuall IP address is chosen, it must be entered here.

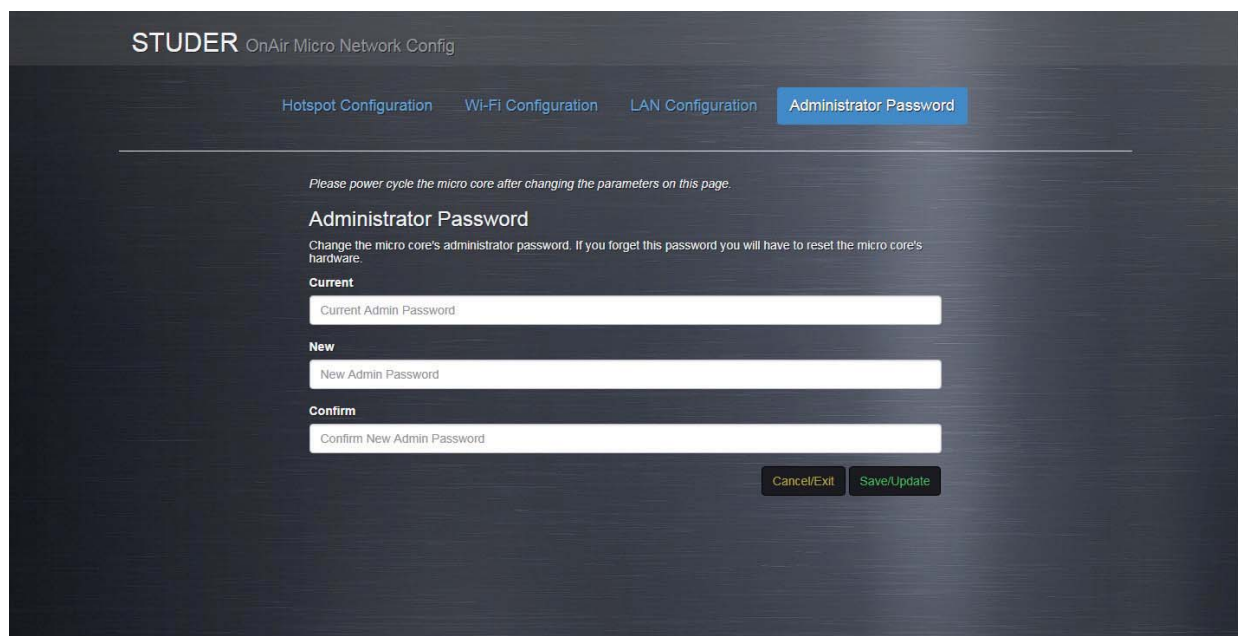
Netmask This is the submask of the manually enetered IP address (normally 255.255.255.0)

Gateway Here a gateway address can be entered if needed.

Please note that the network section of the computer device that is used to control the Micro Core must be configured to match the LAN settings that are entered here. The IP address must be different from the Micro Core's address, but ist must be in the same subnet.

Example : When the Micro Core's IP address and netmask is : 10.10.2.1 / 255.255.255.0 , then the computers address could be 10.10.2.5 - where the first three numbers of this address must be identical to the Micro Core's address : 10.10.2.

Administrator Password Page



The screenshot shows the 'Administrator Password' page in the STUDER OnAir Micro Network Config interface. The page has a dark background with white text. At the top, there is a navigation bar with four tabs: 'Hotspot Configuration', 'Wi-Fi Configuration', 'LAN Configuration', and 'Administrator Password' (which is highlighted in blue). Below the navigation bar, there is a warning message: 'Please power cycle the micro core after changing the parameters on this page.' The main heading is 'Administrator Password', followed by a sub-heading: 'Change the micro core's administrator password. If you forget this password you will have to reset the micro core's hardware.' There are three input fields: 'Current Admin Password', 'New Admin Password', and 'Confirm New Admin Password'. At the bottom right, there are two buttons: 'Cancel/Exit' and 'Save/Update'.

Here, the password for the Network Config page access can be changed .

The default password is : admin

On the Clock Sync tab, the sampling rate as well as the sync options can be found.

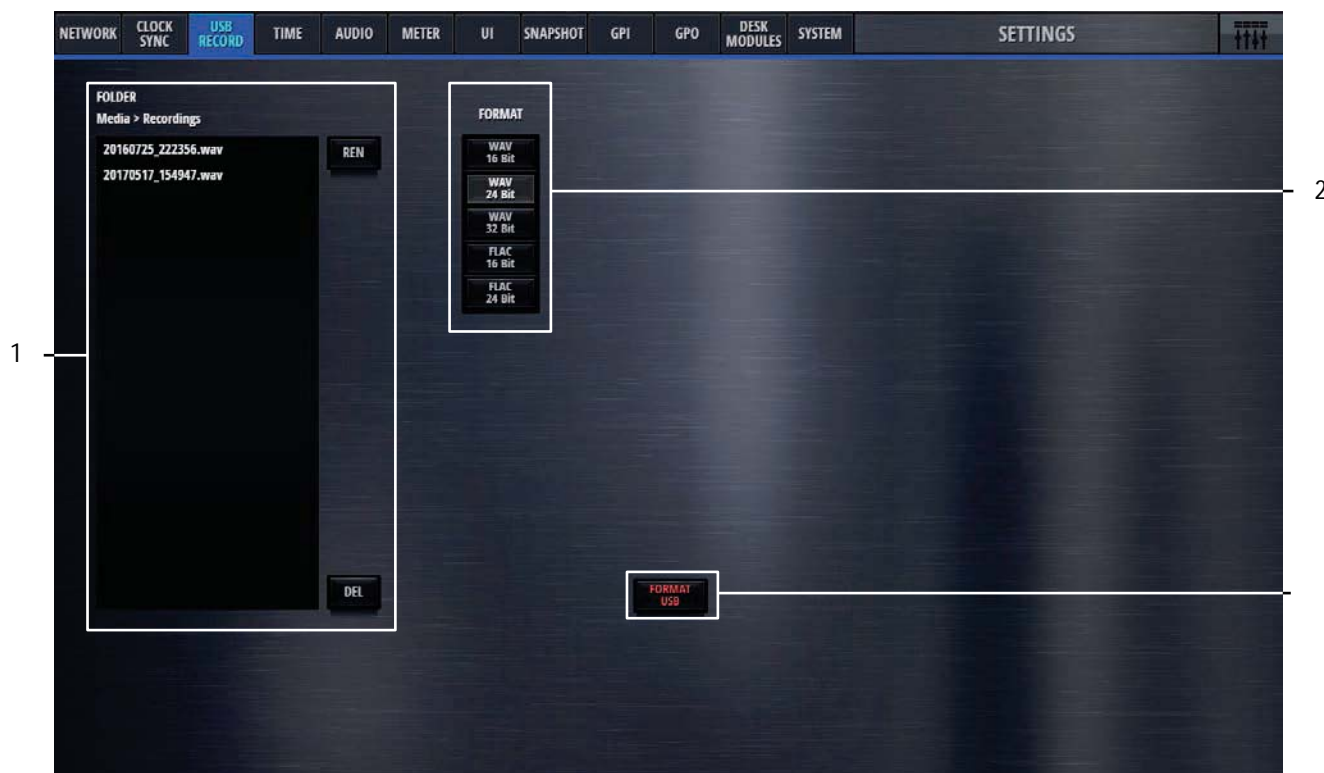


[1] Sampling Rate Sets the sampling rate to either **44.1kHz** or **48 kHz**.

[2] Preferred Sync Source selection The mixer's preferred sync source can be chosen here. As the standard, the internal sync generator is used. If desired, the mixer can be synchronised to the clock received on either the Wordclock-, or one of the AES inputs. The Source State indicators then show the state of each possible sync source. The sync logic makes sure that the preferred sync source becomes active if there is a valid signal with the desired sampling rate. If the preferred sync source is not valid, the sync logic switches to the internal sync generator.

[3] Sync State This is the display of the current sync source. If e.g. the selected sampling rate is 48kHz and word clock is the selected Sync Source, but the external word clock provides 44.1kHz or is even not available, the Sync State will indicate INTERNAL, as the sync logic defaults to internal clock generator running on the selected sampling rate.

On the USB Record tab, all necessary parameters for the USB recording can be set.



[1] Folder In this window all recorded files that are found on the USB media are shown. The folder where the recorded files are stored is called “Recordings”. If there is no such a folder on the USB media, it will be created automatically. Also, recorded files can be renamed or deleted.

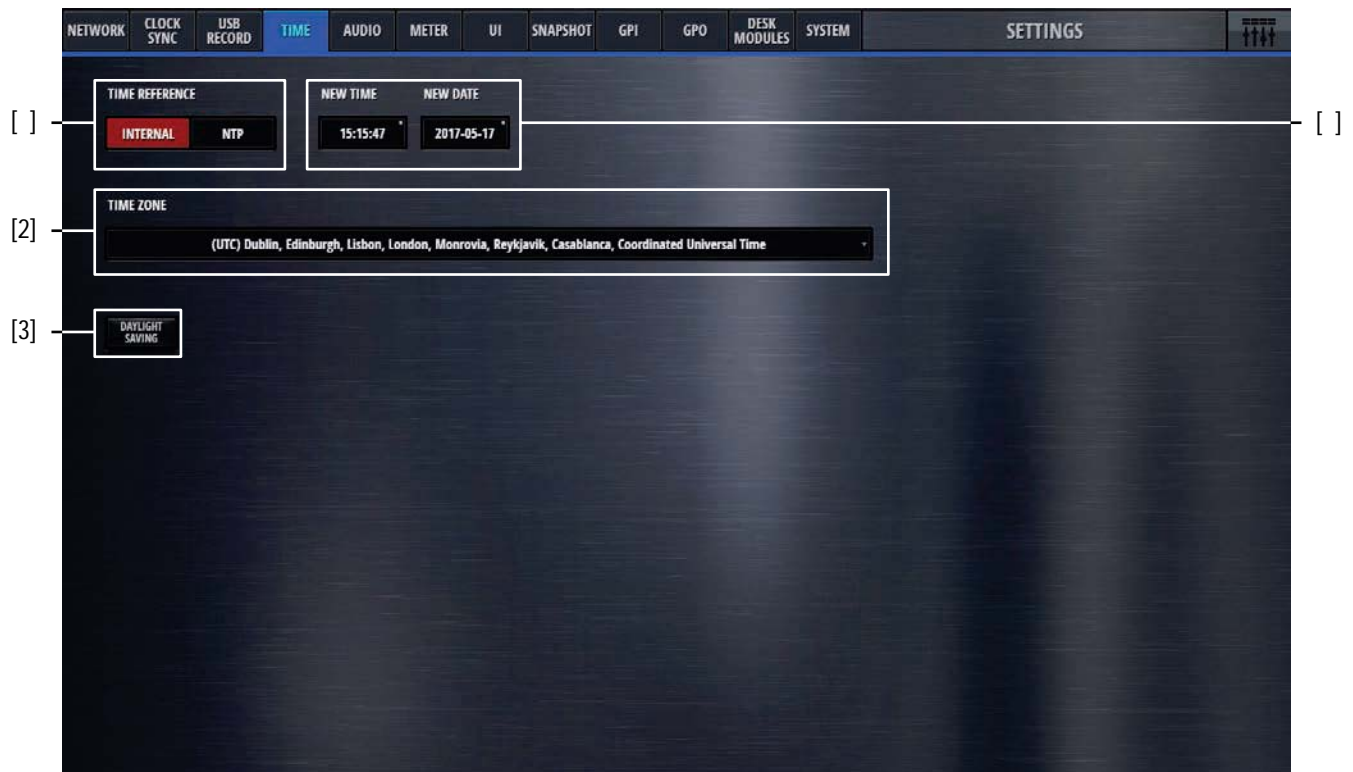
[2] Format Selects the file format of the recordings.

WAV Linear, uncompressed audio file.

FLAC Lossless compressed audio file.

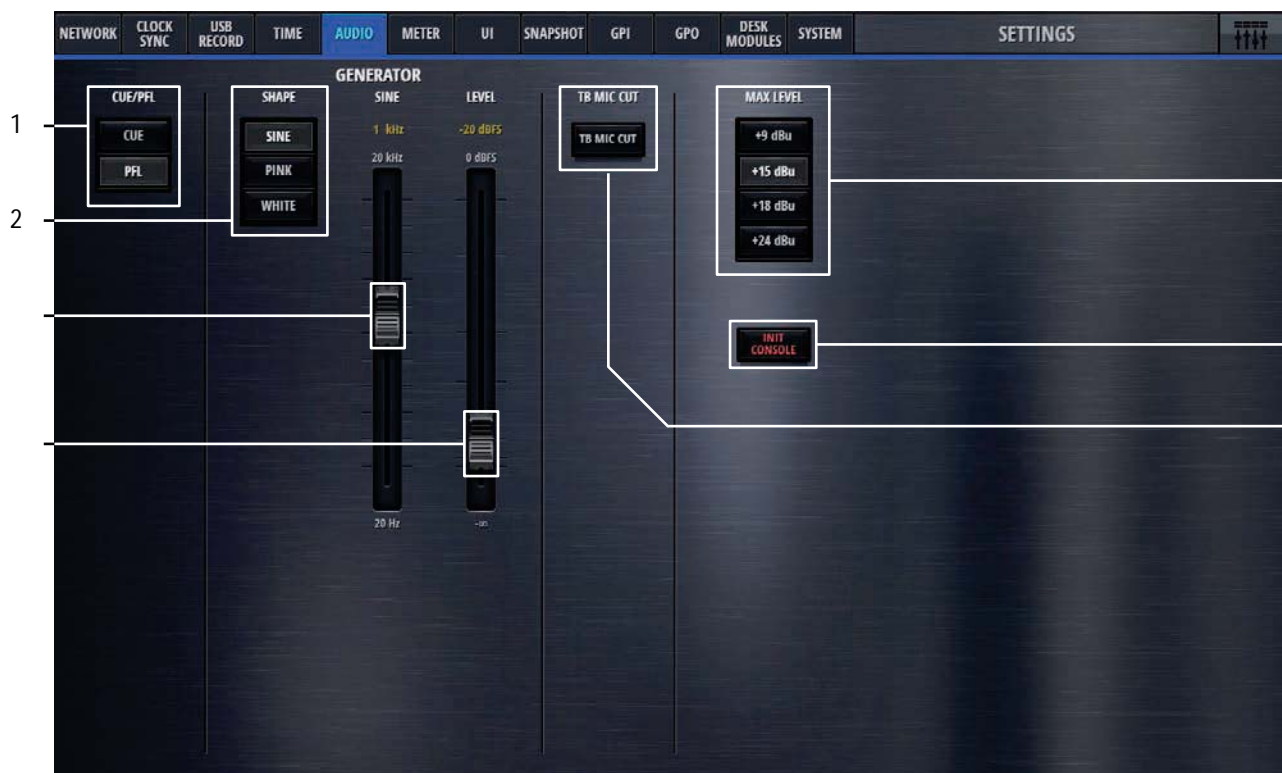
[3] Format USB This button allows to format the inserted USB media with the FAT-32 file system format. All data on the USB media will then be deleted.

The Time tab hosts all controls to set the time settings of the mixer.



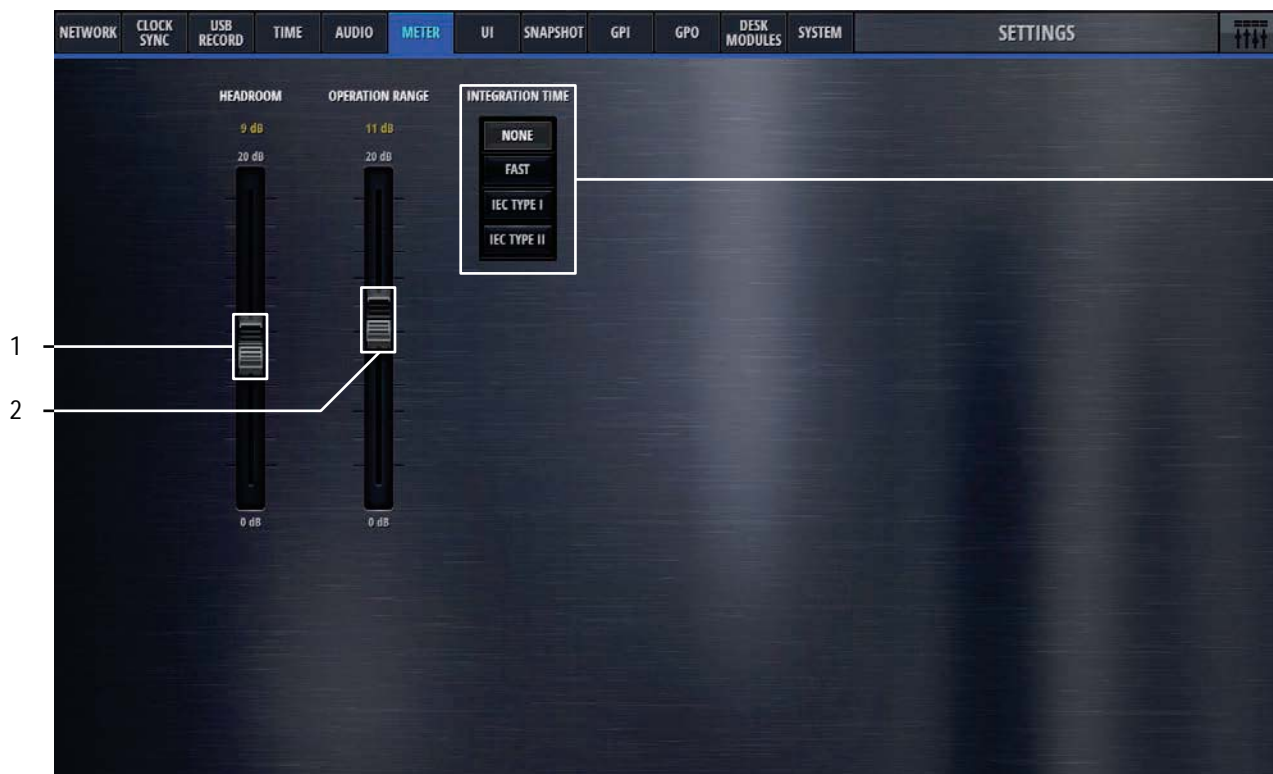
- [1] **Time Reference** Allows to select either an external NTP or the internal time reference. If NTP is selected, an additional field appears where the address of the NTP time server can be specified.
- [2] **Time Zone** Selects the UTC time zone.
- [3] **Daylight Saving** Allows to switch daylight saving either on or off. Daylight saving is active when the button is illuminated.
- [4] **New Time** Allows the operator to adjust the time and date.
New Date

The Audio tab has controls for the PFL mode, internal test tone generator, setting of the analog I/O ports, TB cut and console initialisation.



- [1] **CUE/PFL** Selects the PFL behaviour. CUE mode lets the operator listen to the post-fader signals. PFL is pre-fader-listening.
- [2] **Generator Shape** Allows the operator to select either a sine-wave, pink noise or white noise as the test tone signal.
- [3] **Frequency** This fader controls the sine-wave-generators frequency. The possible frequency range is from 20Hz to 20kHz.
- [4] **Level** The level fader controls the test tone level. It ranges from -infinity to 0dBFS.
- [5] **Max Level** The Max Level setting defines the systems reference line level for 0dBFS. This is a global setting. But it can also be set on a channel by channel basis. This setting needs to correspond with the actual level calibration of the analogue input- and output interfaces. As a standard, the Micro Core is shipped with all analogue levels calibrated to +9dBu. This means that the highest possible analog signal that leaves the mixer is +9dBu. And it also means, that signals which are higher than +9dBu will clip the A/D converters.
- [6] **Init Console** The Init button resets all mic gain values in reference to the selected Max Level setting.
- [7] **TB Mic Cut** TB Mic Cut is a security feature to prevent a TB signal from going on-air. The TB Mic Cut function can be activated/deactivated here. As soon as the TB is activated to anywhere, the associated channel will be cut pre-fader. This is valid for channels of role DJ, Guest, Input for Send 1..4.

On the Meter tab, the parameters of the mixer internal metering can be set.



[1] Headroom Sets the top, red area of the meter. The default value is 9dB, this means that meter values above -9dBFS are then displayed in red meter bar elements.

[2] Operation Range This is the mid section of the meter where the signal is displayed in green meter bar elements. Meter bar elements below the operation range are yellow.

[3] Integration Time Sets the meters integration time.

None 0 ms

Fast 1 ms

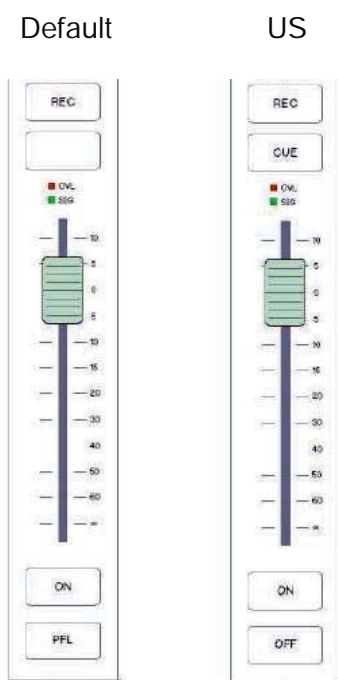
IEC Type I 5 ms

IEC Type II 10 ms

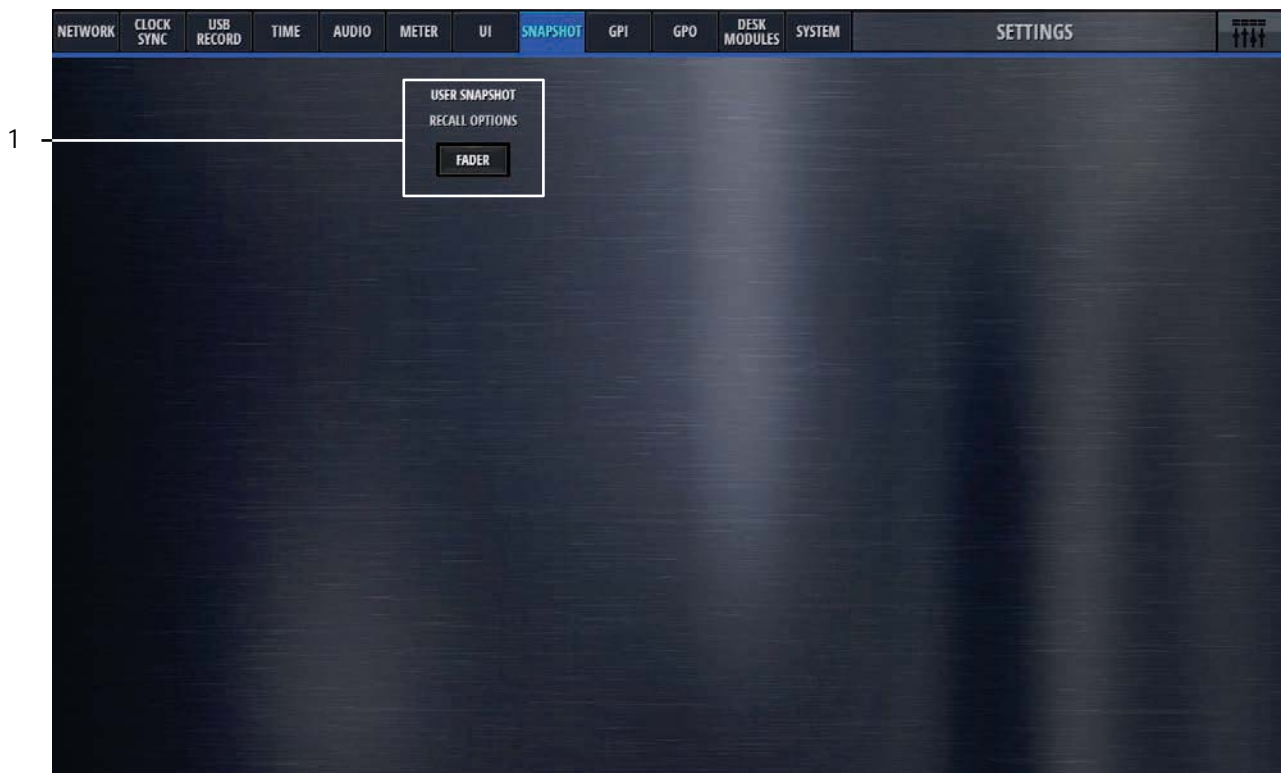
The UI settings tab allows to switch the button assignment of the User Interface from default to US.
 The chosen mode is valid for the GUI as well as for the hardware Micro Fader module.



[1] Button Assignment Changes the button assignment mode.



The Snapshot tab allows to set snapshot recall options.



[1] Fader This button allows to protect all input channel faders from snapshot recall.

Note : Please note that any channel fader that is On-Master, is protected from snapshot recall anyway - irrespective of this setting.

The GPI tab is the page where all general purpose input functions are configured and activated.



[1] On/Off Lets the operator activate the GPI. The button is illuminated when active.

[2] Dir The Polarity of the signal at the input pin: High=Active is positive-, Low=Active is negative polarity.

[3] Sensitivity Considering the polarity, the sensitivity defines whether the input function reacts on Rising edge, Falling edge or Level changes.

[4] Action Action is only relevant, if sensitivity is falling edge or rising edge. In this case, it defines if the input function activates (Activate), deactivates (Deactivate) or toggles (Alternate) the parameter value. Usually Action is set to Alternate. Activate and Deactivate are used in case where two GP Inputs for the same GPIInput Function are available, e.g. ON button and OFF button.

[4] Time Defines the time a pulse at the input pin must have at least to be interpreted as momentary. Time is only relevant if Sensitivity is Level.

Time = 0 : Momentary only. Set the parameter according to Level

Time > 0 : Momentary and Latching. Momentary (if level is active for more ms than Time). Set parameter value according to Level. Latching (if level is active less for less ms than Time) toggle the parameter value (on falling edge)

If the pulse is shorter than the specified Time, the Function is latched.

- [5] Function Defines the function that is triggered from the GPI
- [6] Parameters Depending on the GPI Function, a parameter of the function can be chosen here. (E.g. a channel number).

The two following tables show all Input Functions :

Momentary only or momentary and latching functions :

Function	Argument 1	Argument 2	Argument 2	Description
CHANNEL ON	Channel 1..12 Send 1..4	--	-	Activate/Deactivate the specified On/Off
CHANNEL PFL	Channel 1..12 Send 1..4 PRG, REC	-	-	Activate/Deactivate the specified PFL On/Off
COUGH	Channel 1..12	-	-	Activate/Deactivate TB Mic Cut of the specified Channel
TALKBACK	Source : TBfromCh1..12 TBfromExtern	Destination : TBtoCR TBtoDJ TBtoGuest TBtoSend1..4 TBtoExtern	-	Activate/Deactivate TB from specified source to destination
LSP CUT	-	-	-	Activate/Deactivate the loudspeaker Cut
LSP DIM	-	-	-	Activate/Deactivate the loudspeaker Dim

Event driven functions:

Function	Argument 1	Argument 2	Argument 2	Description
SET CR MON SRC	PRG, REC Send1..4 EXTERN			Set the specified source for the CR monitoring
SET GUEST MON SRC	PRG, REC Send1..4 EXTERN FOLLOW CR			Set the specified source for the Guest monitoring
LOAD SNAPSHOT			Snapshot name	Recall the specified snapshot
TRACK PLAYER	NEXT STOP			Start the next track in the Playlist Stop the Playlist
RESET PFL				Reset any active channel PFL. (Similar to the Reset PFL button on the GUI).

The GPO tap is the page where all general purpose output functions are configured and activated.

	OFF/ON	DIR	TIME	SENSITIVITY	FUNCTION	PARAMETERS
GPO 1	ON	↓	40 ms	RISING	CHANNEL ON	CH 1
GPO 2	ON	↓	40 ms	RISING	CHANNEL ON	CH 3
GPO 3	ON	↑	40 ms	RISING	FADER START	CH 3
GPO 4	ON	↑	40 ms	RISING	FADER START	CH 4
GPO 5	ON	↑	40 ms	RISING	RedLight Studio	
GPO 6	OFF	↓	0 ms	RISING	NO FUNCTION	
GPO 7	OFF	↓	0 ms	RISING	NO FUNCTION	
GPO 8	OFF	↓	0 ms	RISING	NO FUNCTION	
GPO 9	OFF	↓	0 ms	RISING	NO FUNCTION	
GPO 10	OFF	↓	0 ms	RISING	NO FUNCTION	
GPO 11	ON	↓	40 ms	RISING	FADER START	CH 11
GPO 12	ON	↓	40 ms	RISING	FADER START	CH 12

1 2

[1] On/Off Lets the operator activate the GPIO. The button is illuminated when active.

[2] Dir The Polarity of the signal at the input pin: High=Active is positive-, Low=Active is negative polarity.

[3] Time Depending on the Time, the Output Logic either operates as level- or edge sensitive.

[4] Sensitivity The Sensitivity defines how the value affects the signal at the output pin. Possible values are RISING EDGE, FALLING EDGE or LEVEL.

[5] Function Chooses the function that triggers the GPO signal.

[6] Parameters Parameters defines the channel number on which the function is based on.

The following table shows all output functions :

Function	Argument 1	Argument 2	Argument 2	Description
CHANNEL ON	Channel1..12 Send1..4			Reflects the On/Off status of channels and sends.
CHANNEL PFL	Channel1..12 Send1..4 PRG, REC			Reflects the PFL On/Off status of channels, send and Σ -busses.
FADERSTART	Channel1..12			Reflects the AND combination of channel's On/Off- and fader status.
FADERSTART+PFL	Channel1..12			Same as FADERSTART, but also active when channel's PFL is active. (FADERSTART OR PFL.)
CHANNEL ON MASTER	Channel1..12			The function becomes active when the specified channel is either on PRG or REC output. (Channel On-Master condition)
RedLight Studio				The function becomes active when a microphone is either on PRG or REC output. In other words, at least one channel with role DJ or Guest fulfils the Channel On-Master condition.
ONAIR				The function becomes active when at least one channel is OnAir.
RECORD				The function becomes active when at least one channel is on the REC output. One of the the following conditions must be fulfilled for at least one channel: <ul style="list-style-type: none"> • the channel is On AND the fader is open AND the channel is assigned to REC bus AND the REC fader is open • the channel is On AND the fader is open AND Off Air Record is active on the channel AND the REC fader is open
TALKBACK	Source : TBfromANY TBfromCH1..12 TBfromEXTERN	Destination : TBtoANY TBtoCR TBtoDJ TBtoGUEST TBtoSend1..4 TBtoEXTERN		The function becomes active when TB from Source to Destination is active. The GPOutput can be used to control external intercom systems for TB button illumination. The function does not indicate incoming TB.
CR MON SRC	PRG, REC Send1..4 EXTERN PFL			The function becomes active when the specified monitoring source is currently active on the CR monitoring.
GUEST MON SRC	PRG, REC Send1..4 EXTERN FOLLOW CR			The function becomes active when the specified monitoring source is currently active on the Guest monitoring.
PFL ACTIVE				The function becomes active when any channel PFL is active.

The Desk Modules tap is the page where one or two Micro Fader modules can be configured to be used with the Micro Core.

The screenshot displays the 'DESK MODULES' configuration page. At the top, a navigation bar includes tabs for NETWORK, CLOCK SYNC, USB RECORD, TIME, AUDIO, METER, UI, SNAPSHOT, GPI, GPO, **DESK MODULES**, SYSTEM, and SETTINGS. Below this, the 'CLOUD SETTINGS' section contains five fields: MulticastGroup (239.255.10.1), Cloud Id (1), Node Name (Studio1_Core), Port (3000), and Multicast TTL Hop Limit (10). The 'DESK MODULES' section features a table with columns for NAME, CLOUD ID, NODE ID, PAIRING, STATE, and VERSION. A single row is visible for 'OnAir Micro Fader' with Cloud ID 1 and Node ID 35303237. Below the table, a dropdown menu for 'PAIRING' is open, showing options: CH 1-6 (selected), NONE, and CH 7-12. Other controls include 'DISCONNECT ALL', 'LOCATE', and 'UPDATE FW'. At the bottom, a row of numbers (12, 1, 1, 1, 1, 11) is aligned with the table columns.

[1] MulticastGroup The multicast group address setting used for the communication to the Micro Fader modules can be entered here.

[2] Cloud ID Current Cloud ID of the Core

[3] Node Name Shows the Micro Core's Node_Name

[4] Port Displays settings of the Cloud communication

[5] Multicast TTL Hop Limit Displays settings of the Cloud communication





[6] Name Shows the Node_Name as configured in the Setup of the Micro Fader module

[7] Cloud ID Current Cloud ID of the Micro Fader module

[8] Node ID Node ID of the Micro Fader module

[9] Pairing The column shows the pairing state of a Micro Fader module

[10] State Shows the current Connection/Pairing state of Micro Fader modules within the network.

Icon	Description
	Paired to this Core - Connected
	Paired to this Core - disconnected
	Paired to this Core - connected, but different Cloud ID
	Not paired

[11] Version The column indicates the Micro Fader module firmware version for each Micro Fader module available on the network.

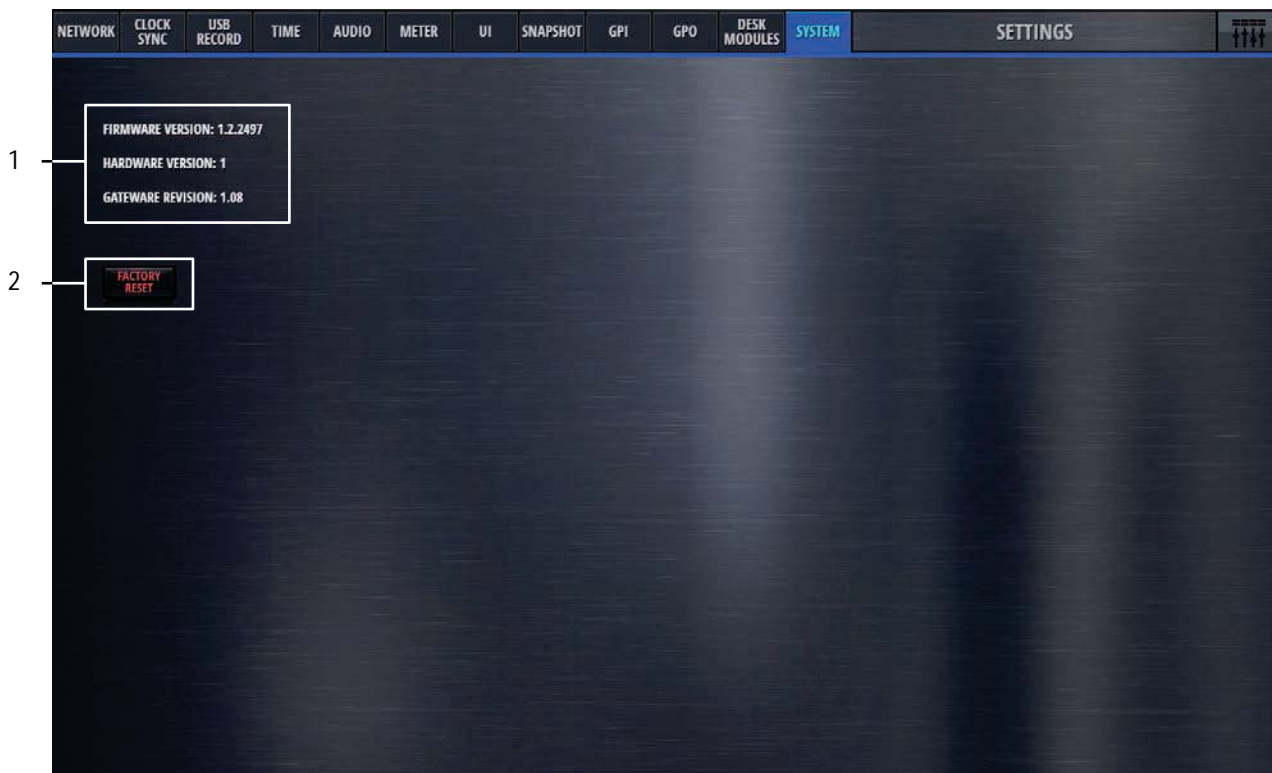
[12] Disconnect All This button disconnects all paired Micro Fader modules, which are currently available on the network.

[13] Channel Selection ComboBox It is used to pair or un-pair a Micro Fader module.

[14] Locate the LOCATE function is activated on the corresponding Micro Fader module - the Micro Fader module will flash for five seconds.

[15] Update FW It allows updating the firmware on each Micro Fader module which is paired to the Micro Core.

The System tab on the settings page displays current FW and HW versions and lets the operator reset the console to factory settings.



[1] Revision Status Displays current Firmware, Hardware and Gateware version numbers.

[2] Factory Reset Resets the mixer to factory settings.

3 SETUP

3.1 Setting up the Network



To configure all network settings, please go to the Settings page. There, on the Network tab, you can configure the network settings to your work with your network environment.

Please see in [chapter 1.5](#) how the Micro Core can be used in a network, and then in [chapter 2.4](#) how the settings are configured.

3.2 Setting up the Micro Fader modules

To configure one or two Micro Fader modules that are to be used with the Micro Core, please go to the Settings page. There, on the Desk Modules tab, you see all available Micro Fader modules, and you can assign a range of channel strips to one or two of them. This configuration process is called “pairing”.

Please see in [chapter 2.4](#) how these settings can be configured.

Micro Fader Web GUI

If a browser is prompted to the standard IP address of a Micro Fader module (10.10.2.2) - the settings page of the connected Micro Fader module is shown.

In the page, the device settings can be changed and updated :

- DHCP On/Off
- IP Address
- Subnet Mask
- Gateway
- Cloud ID
- Node Name
- Port

Welcome to STUDER MicroFader controller!

Settings

SETTING	CURRENT VALUE	EDIT ?
HW Version	1	
FW Version	3	
MAC Address	0:17:24:c5:0:8	
DHCP	OFF	<input checked="" type="radio"/> OFF <input type="radio"/> ON
IP Address	10.10.2.2	<input type="text"/>
Subnet Mask	255.255.255.0	<input type="text"/>
Gateway	0.0.0.0	<input type="text"/>
Cloud ID	1	<input type="text"/>
Node name	FADER_0:17:24:c5:0:8	<input type="text"/>
Port	3000	<input type="text"/>
		<input type="button" value="Clear all fields"/> <input type="button" value="Update Settings"/>

Important : After changing any of the Micro Fader’s settings, first click on the **Update Settings** button, and then on the **Reboot Device** button. Only after a reboot

of the Micro Fader module, all of the changed settings will be applied.

Note : It is necessary to change the IP address of one Micro Fader module, if two Micro Fader modules are to be used together. (This needs to be done before the Micro Fader modules can be assigned to the Micro Core.)

Fader Calibration The fader's 0dB position can be calibrated.
And the fader start point can also be calibrated - which is the position where the fader start signal is triggered when opening the fader from -infinity towards 0 dB.

Calibration

Calibrate Fader's 0dB
Calibrate Fader start point

Reboot Device

Reboot Device

3.3 Setting up the Monitoring



In total, there are two monitoring sections that can be used within the Micro Core.

- The CR Monitoring section (with both, loudspeaker and headphones outputs)
- The Guest Headphone section (with headphones output only)

The actual physical outputs that are used by these two monitoring sections can be freely assigned.

Step 1 Chose the monitoring section that you would like to configure.

Step 2 What should be connected ?

- Active loudspeaker
- Headphone
- Meter

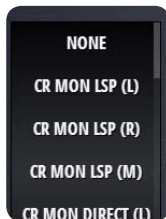
Step 3 What physical connector ?

Step 4 Assign the output :

This is done on the CR Config page, on the Targets tab.

Any of the outputs viewable on this page can be used :

- 12 Line Outputs
- 8 Dante Outputs
- 2 AES Stereo Outputs
- 2 Unbalanced Jack Stereo Outputs



The selectable sources for the monitoring sections are the following :

- CR MON LSP (L)
- CR MON LSP (R)
- CR MON LSP (M)

These are the outputs of the CR monitoring section that are meant for a direct connection of an active loudspeaker. Normally, the left and right speakers are wired individually. The two stereo signals are downmixed internally to a mono output (on the source marked M). This source can be used if a single mono speaker will be used as CR mon speaker.



- CR MON DIRECT (L)
- CR MON DIRECT (R)
- CR MON DIRECT (M)

The sources above, named DIRECT, are providing the same signal as CR MON LSP, but without level control. These are normally used to connect a meter that measures the level of the currently selected CR source. Be careful not to connect an active loudspeaker to such a DIRECT source, as the signal is fullscale and no level control is possible.



- DJ HP (L)
- DJ HP (R)
- DJ HP (M)

These are the outputs carrying the HP signal of the Control Room Monitoring.



- DJ HP DIRECT (L)
- DJ HP DIRECT (R)
- DJ HP DIRECT (M)

The HP signal of the Control Room Monitoring is also available as DIRECT signal that has no volume control. This could be used if fed to a remote HP amplifier when the DJ is remotely operating the Micro Core.



- GUEST HP (L)
- GUEST HP (R)
- GUEST HP (M)

The GUEST HP Monitoring section only has a volume controlled output.

When the outputs are assigned as desired, the Config pages of the monitoring sections can be used for further configuration.

CR Monitoring Options page :

Monitoring Source Here the actual monitoring source is chosen.

Cut This button lets the operator manually cut the CR monitor.

PFL to Mon With this option active, the current CR monitoring source gets replaced with the PFL signal, as long as any PFL is active.

Mono This button mixes the stereo CR source down to a mono signal for both, CR speakers and CR headphones.

HP Split With this mode active, the PFL signal will be fed to the left channel of the headphone, if PFL is active on any channel. On the right channel, still the previously selected CR source will be heard. Both signals are then downmixed to mono.

Once PFL is released, the current CR source will be heard in stereo again. If PFL is already selected as the CR source, actually pressing PFL on any channel will not change the stereo PFL bus as the monitoring source.

Guest Monitoring Options page :

Monitoring Source Here the actual monitoring source is chosen. **FOLLOW CR** choses the currently active source of the CR monitoring section.

Note : TB return signals are heard via the two monitoring sections :

Please note that TB return signals are fed to the CR monitoring section in case of TB to the DJ.

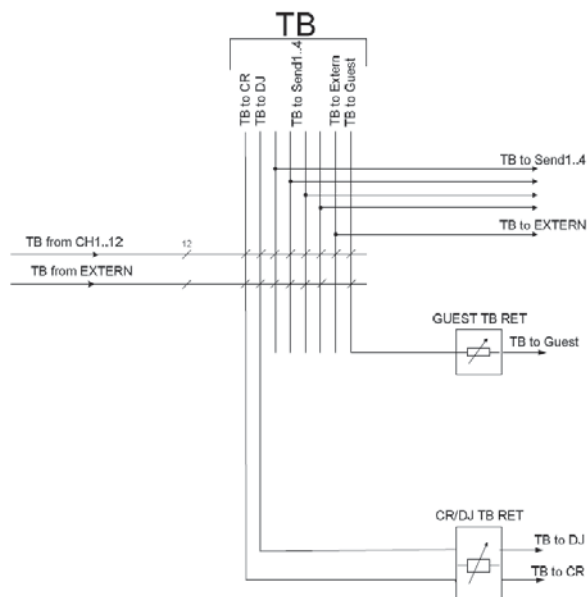
In case of TB to Guest, TB return signals are fed to the guest monitoring section.

When a TB return is active, the current monitoring signal will be dimmed by 20dB.

3.4 Setting up TB



The Micro Core provides a powerful internal TB matrix.



The DJs TB possibilities The DJ can use the Talk buttons on channels of the role “Guest” and “Inputs for Send” and talk to the Studio guests and outside sources such as a telephone guest.

These **Talk** buttons automatically appear on the GUI. They are meant to be used by the DJ and therefore use the DJ Mic Input as the source signal.

The DJ can also talk to the External TB target (TB to Extern). The physical output, where this signal leaves the Micro Core can be assigned freely. Any of the outputs viewable on the Targets page can be used.

TB TO EXTERN is the name of the signal that has to be assigned.

The TB possibilities of others TB from other channels than th DJ’s input channel can only be activated by GPI’s.

Via GPI, TBfromCH 1-12 as well as TBfromExtern can be activated to speak to the following possible targets :

TBtoCR
 TBtoDJ
 TBtoGuest
 TBtoSend1
 TBtoSend2
 TBtoSend3
 TBtoSend4
 TBtoExtern

3.5 Setting up N-1 / Sends



There are four send busses within the Micro Core. Each bus can either be used as an Aux bus or as a N-1 bus.

The setup of all parameters concerning the typ of the bus, as well as the actual mix from the input channels, can be done in the Config page of the bus. Please see [chapter 2.3.2](#).

3.6 Setting up GPIOs



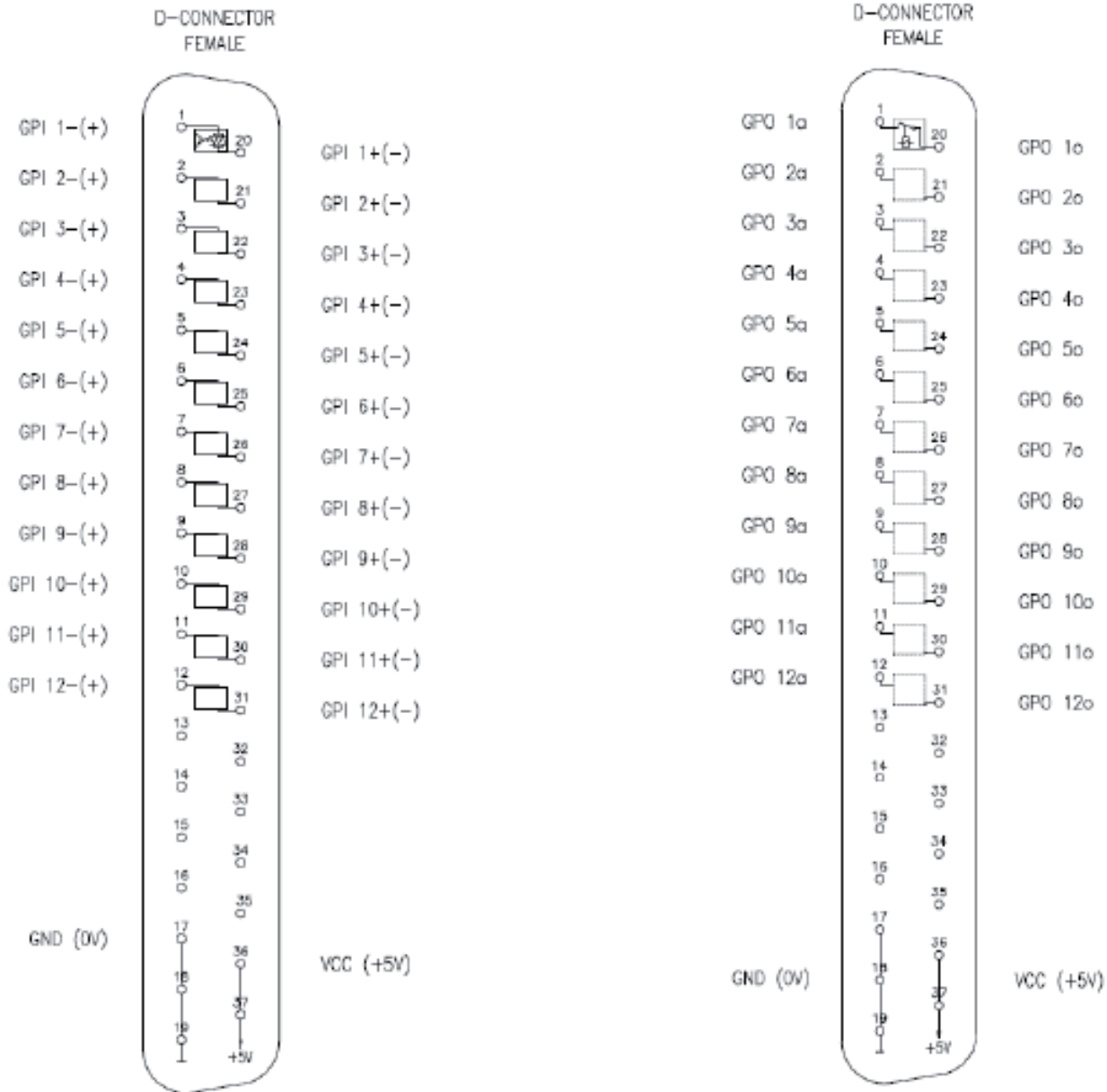
GPIO (General Purpose Inputs and Outputs) are an effective interface for the mixer to communicate with the studio environment. The upper d-type connector hosts 12 pairs of pins where a voltage pulse or level can be detected (GPI). The lower d-type connector hosts 12 pairs of pins where a relay can establish a connection between the pins (GPO).

GPI’s There are many mixer internal functions that can be used via the 12 GPI’s. Mixer internal functions that can be triggered via GPIInputs are called Input Functions. Please refer to the table in [chapter 2.4](#) for a complete description of all Input Functions.

GPO's There are many mixer internal functions and states that can activate a GPO : Mixer internal functions that can switch a GPOutput are called Output Functions.

Please refer to the table in [chapter 2.4](#) for a complete description of all Output Functions.

Connector Pinout :



3.7 Setting up Dante

To control and setup the Dante network, please use the Dante Controller software that can be downloaded under :

<https://www.audinate.com/products/software/dante-controller>

Within the Dante Controller software, all network devices are displayed in a matrix and you can make the signal routing from and to the different devices.

Within the Micro Core, the received Dante streams are available from the input ports AES67/DANTE #1 - 8.

The signals that are assigned to the output ports AES67//DANTE#1-8 will be transmitted as Dante streams.

There are two AES67/Dante ports, which means that the Dante Controller will see two Micro Core devices when both ports are connected to the Dante network.

Note : Since the built-in Dante ports do not accept external sync reference (Enable Sync to External), it is not meaningful to use the Micro Core as Preferred Master within a Dante/AES67 network.

Device Name	Sync	Mute	Clock Source	Primary Status	Secondary Status	AES67 Status	Preferred Master	Enable Sync To External
Dante32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	External Clock	Master	N/A	Master	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Micro-0a4a21	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dante	Slave	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>
Micro-0a4a2e	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dante	Slave	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>

3.8 Firmware update

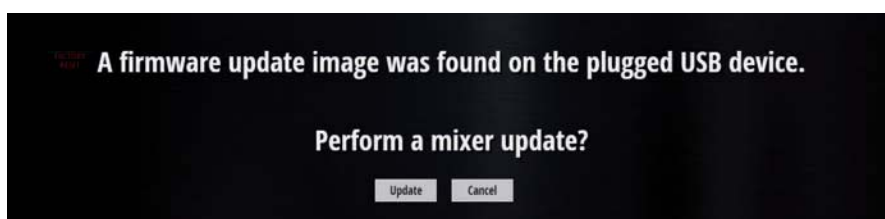
To perform a software update of the Micro Core, the latest software file can be downloaded from the Studer website. The software file has a .zip file extension and is named like this :

oamupdate-X.X.XXXX-usb.zip

Where the Xs stand for the latest software version.

This file can be copied to the root folder of a USB media, which then can be inserted into the Play/Rec USB port of the base unit.

Once the USB media is scanned, the software file is automatically detected and the update process is started. All following process steps are then guided by instructions that are shown on the screen or GUI of the Micro Core.



3.9 Emergency factory reset

Full factory reset The following scenario executes a full reset including reloading the factory firmware and factory default settings :

- Step 1** Connect a USB keyboard to the Micro Core's GUI connectors.
- Step 2** During startup, as soon as the CORE LED lights up, press the **F12** key. (Press the key in the same way as on a personal computer to enter it's BIOS settings.)

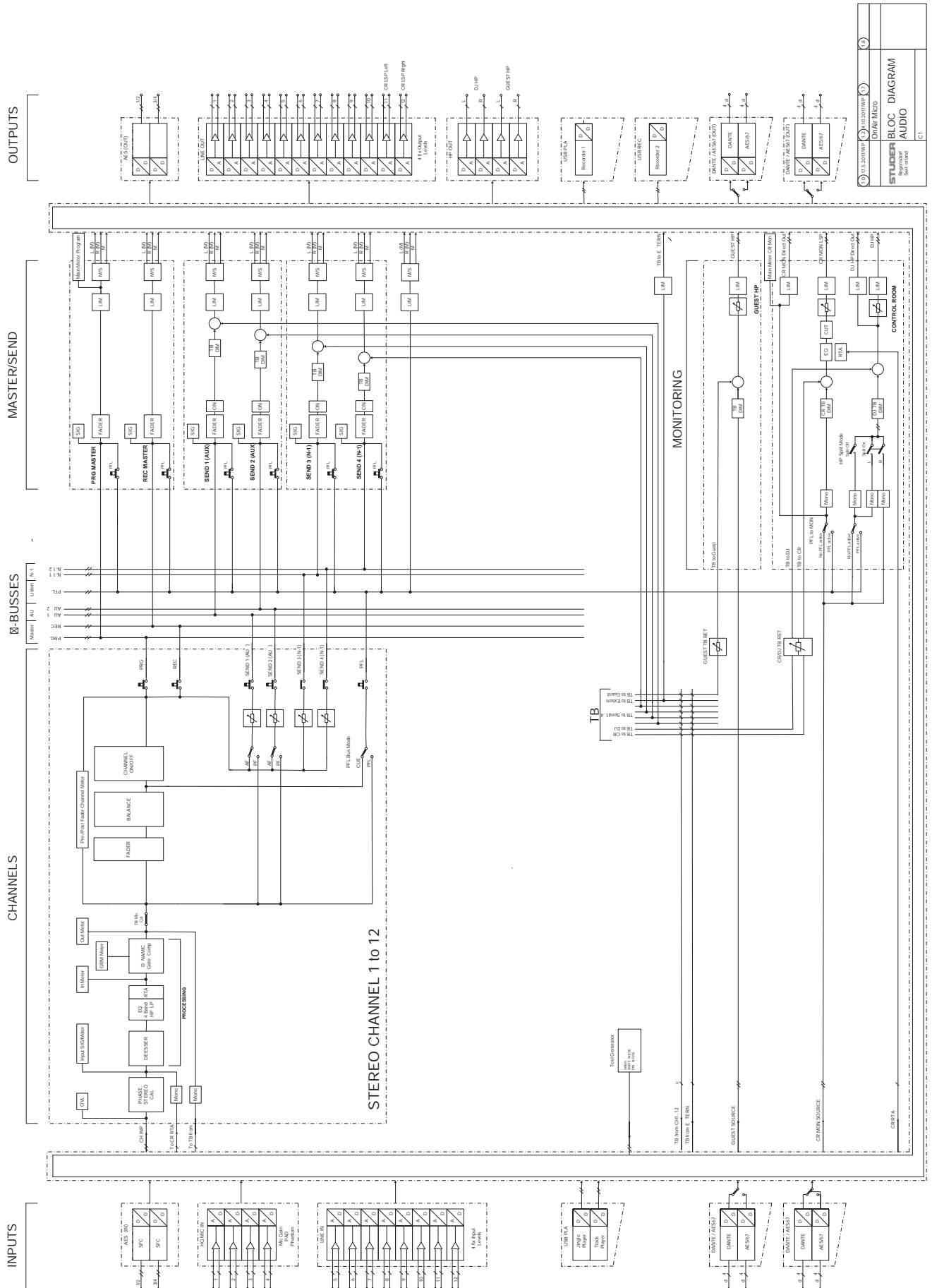
As soon as the Micro Core detects the F12 key pressed during startup, it reloads the factory firmware and resets all parameters to factory default.

Reset of network settings The following scenario resets the network settings to factory default :

- Step 1** Connect a USB keyboard to the Micro Core's GUI connectors.
- Step 2** During startup, as soon as the CORE LED lights up, press the **DEL** key. (Press the key in the same way as on a personal computer to enter it's BIOS settings.)

As soon as the Micro Core detects the DEL key pressed during startup, it resets the network settings to factory defaults and confirms it by flashing the blue WiFi LED for 5s.

4 BLOCKDIAGRAM



5 TECHNICAL SPECIFICATIONS

ic Line Inputs	Conditions Details	Value
General Conditions:	Gain setting 15 dBu \pm 0 dB _{FS} unless otherwise noted	
Input Level range	Max. level @ 0dB _{FS} , 86 one-dB steps	-60 to +26 dBu
Input Impedance		6.8 k Ω
Frequency response	+0 dB / -0.3 dB	20 Hz to 20 kHz
	+0 dB / -0.2 dB	30 Hz to 20 kHz
D Noise	1 kHz, -1 dB _{FS} , 15 dBu	< -97 dB
	20 Hz to 20 kHz, -30 dB _{FS}	< -110 dB
Common mode rejection ratio (CMRR)	30 Hz to 20 kHz, full gain range	> 70 dB
	1 kHz, < -20 dBu, > 35 dB gain	100 dB typ.
Crosstalk	1 kHz	\leq -110 dB
Equivalent Input Noise	R _{source} = 200 Ω , maximum gain	-126 dBu
RF rejection	RF rejection with common mode choke	Yes
Analogue High-Pass Filter	switchable	75 Hz, 12 dB/Oct
Phantom Power	switchable	48 V
Zero cross detection and Sample Hold	for click free gain changes	Yes

Line Inputs	Conditions Details	Value
Input Level	Max. level @ 0 dB _{FS} , four steps, software controlled	+9, +15, +18, +24 dBu
Input Impedance		> 10 k Ω
Frequency response	20 Hz to 20 kHz	+0 dB / -0.2 dB
D Noise	1 kHz, -1 dB _{FS} , 15 dBu	< -97 dB
	20 Hz to 20 kHz, -30 dB _{FS}	< -110dB
Common mode rejection ratio (CMRR)	30 Hz to 20 kHz, all four gain settings	> 60 dB
Crosstalk	1 kHz	> -110 dB
RF rejection		Yes

Line Outputs	Conditions Details	Value
Output Level	Max. level @ 0 dB _{FS} , four steps, software controlled	+9, +15, +18, +24 dBu
Output Impedance		40 Ω
Electronically balanced		Yes

AES EB Inputs	Conditions Details	Value
Input Sensitivity		0.2 V
Input Impedance		110 Ω
SC range		32 to 192 kHz

Latency	Conditions Details	Value
Input to Output Delay	Mic In - ADC - DSP - DAC - Line Output	1.8 ms

AES EB Outputs	Conditions Details	Value
Output Level		3 V
Output Impedance		110 Ω

Power Supply	Conditions Details	Value
Primary Input Voltage range	Power supply auto-ranging, with power factor correction (PFC); EN/UL approved	100 to 240 V AC \pm 10% 50 to 60 Hz
Power Consumption	Micro Core	100 W

Weights	Value
Micro Core	7 kg

6 GLOSSARY

- AGC** Automatic Gain Control
- AES3** Also AES/EBU - is a standard interface for digital audio. A stereo audio signal on a single XLR cable.
- Aux** Auxiliary mix - an additional mix possibility (four on the Micro Core) that can be independent of the main PRG master (PRE-Fader Aux) - or that is also taking the channel fader level into account (POST-Fader Aux).
- CUE** The CUE button lets the operator listen to the post-fader signals of individual channels .(As oposed to PFL which is pre-fader-listening.)
- CR** Control Room monitoring. This is usually the main loudspeaker monitoring system that is used by the operator or DJ.
- Dante** Digital audio network through Ethernet cable.
- DJ** Disc-Jockey - an On Air operator that runs a radio show as a single person.
- DSP** Digital Signal Processing - the electronic hardware that calculates the audio processing.
- GEQ** Graphic Equalizer - an equalizer with 31 filter bands where each band represents a fixed frequency. The gain sliders of each band are graphically arranged next to each other - so that the resulting curve of the sliders represents the GEQ's filter response.
- GPIO** General Purpose Inputs and Outputs that can be configured by the operator.
- GPI** General Purpose Inputs.
- GPO** General Purpose Outputs.
- GUI** Graphical User Interface - the actual graphics on the tablet or computer screen that provides all the control elements of the On Air Micro.
- HDMI** Interface where a digital screen can be connected (High Definition Multimedia Interface)
- HPF** High Pass Filter.
- Jingle** A jingle is a short song or tune used in advertising and radio production.
- N-1** This mode is made for Aux busses that are feeding a return signal to remote positions. It doesn't allow the input signal of the remote source to be assigned to the bus. With this bus mode, the remote source (e.g. a reporter) will never have his own signal in his return feed. This is optimal to prevent echo's that could be introduced through long distance signal transmission.

- Off Air** When a channel's audio signal is not going to the PRG master - this channel is Off Air.
- On Air** When a channel's audio signal is being fed to the PRG master, this channel is On Air.
- On Master** When a channel's audio signal is either on PRG or REC master output
- OVL** Signal overload indication of a channel.
- PFL** PFL is pre-fader-listening.
- PoE** Power over Ethernet - a version of the physical layer of the Ethernet protocol that carries a supply voltage which allows to power equipment directly from the Ethernet cable (up to 25.5 W per unit)
- PRG** The program master bus
- REC** The record master bus
- RTA** Real Time Analyzer - a representation of the audio signal where level bars over the frequency spectrum are calculated in real time.
- TB** Talkback.
- WLAN** Wireless Local Area Network - also called Wi-Fi.